CHRONIC PAIN

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A Terms of Reference
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PART I

INTRODUCTION

INTRODUCTION

> "God whispers to us in our pleasures, speaks in our conscience, but shouts in our pains ...."
>
> CS Lewis "The Problem of Pain"

Everyone experiences pain. Many life events, like stubbing your toe, or banging your elbow, or burning your hand, cause sudden pain. The painful stimulus results in sudden reflex, emotional and behavioral responses to stop or withdraw from the cause of pain. This is the common experience of acute pain. Occasionally, pain is chronic, persisting long after healing should have occurred.The condition of chronic pain is the subject of this report. While reading this report it is important to keep in mind that chronic pain is different than acute pain, and all the characteristics we normally associate with acute pain are not the basis of chronic pain.

Because the understanding and management of chronic pain is complex, and because it has been an unsolved, difficult problem for all involved, this report was requested. No one will be surprised that we will not provide simple answers to the long standing questions that have not had solutions. Rather, we will provide a reasonable understanding of chronic pain, so that reasonable policies can be based on current concepts and understanding.

I have tried to be as objective as possible, taking the stance that I am on no one's "side" in this matter. Although commissioned by the Workers Compensation Board of Nova Scotia, I have tried to approach the problem of chronic pain as a clinical issue, leaving the policies that might result to others.

The method of this study was as follows. The medical literature was reviewed over many months, beginning with 1700 citations on Medline and dozens of books on the subject. A summary report of the medico-legal research was prepared (Appendix B). No attempt was made to produce a textbook, but to note current and important writings on the subject. Only then did I return to the specific questions asked of the study by the Workers Compensation Board. From this background I attempted to give answers to the questions, as best I and the data could provide. As the questions and answers overlapped in areas, they were sometimes combined. I addressed the initial draft of the questions and answers to a respected group of specialists, who deal with chronic pain, and sought their comments and advice. I met with an advisory committee of WCB for their comments. Although I received valuable comments at these meetings, the opinions and conclusions of the report are my own.

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BRIEF SUMMARY

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"Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of tissue damage."

The International Association for the Study of Pain
LaRocca, 1992

"Pain is a hurt we feel"

Richard A. Sternbach

Pain is a unique personal experience that cannot be fully shared by anyone else. We cannot transmit pain, but we can communicate pain by words or by behaviour.

The understanding of pain is complicated further by the fact that the same painful stimulus may be perceived differently by different people, and differently by the same people at different times. The person's reaction to the circumstances surrounding the pain experience and the interpretation of the pain meaning may also be different. Although pain is personal, private and unique, there is often a demand from others that pain and pain situations be objective, public and reproducible. Although pain is personal, subjective and difficult to quantify, it still can be studied, like other similar phenomena like memory and vision.

Acute pain is protective. In most instances a local cause is easily recognized, such as a cut finger or sore joint, even though the pain is perceived in the central nervous system. This type of pain responds to analgesic and narcotic medications, and the response to such pain may be modified by cultural and psychodynamic factors. The emotional and psychological aspects of acute pain relate to how threatening or damaging the person thinks the process may be. The reaction to a severe pain in our ankle is different from a mild or moderate chest pain. A football player may continue to play despite a fracture, while a stressed person may leave work because of a headache. The mechanisms involved in acute pain are well studied, and although interesting and important, acute pain is not the subject of this report.

Chronic pain is not protective (Bonica, 1990). It has very complex and multifaceted features, and cannot be understood by simply applying the concepts of acute pain and its causes and treatments. Chronic pain does not respond well to analgesics and narcotics and is resistant to most traditional therapies for pain. There may not be an easily definable local cause. Only a third of the patients note an event or injury as initiating the pain and in most of these instances, the pain seems out of proportion to the suspected underlying disorder or trauma The presence of mild depressive overtones, and other psychological features in many of the patients has led to a suspicion that psychological mechanisms underlie this disorder. As we shall see, it is much more complex than that, as many of the accompanying features may be a result of having chronic pain.

Chronic pain is an important medical and social problem for three major reasons. It is distressing to patients, as it alters their lives and sometimes their employment, and it responds poorly to treatment. Chronic pain is a common condition that has huge financial costs to society. Finally, despite its frequency and large costs, it is difficult to understand and manage, and eventually becomes a source of stress and misunderstanding to all concerned. Chronic pain is frustrating for everyone - the patient, their family and friends, their employers, the insurance and compensation agencies, the courts and their physicians. Because the patients often don't respond to treatment, and the patient and the physician continue to search for a local cause, and a logical specific treatment.The search is unsuccessful in 94% of cases (Swanson), so the frustration increases.

The human suffering and costs to society in lost time and productivity, compensation and legal costs, medical treatments and personal costs measured in billions of dollars annually (Spitzer, 1993). Although less than ten percent of all pain patients go on to become chronic, the chronic pain patients account for three quarters of the overall costs of health care and compensation for pain, and represent a increasing group of very distressed, suffering people.

Lastly, it has been difficult to know how to understand and evaluate people with chronic pain, and how to fairly treat and compensate them (fair to the patient and family, fair to the employer, fair to society). Chronic pain is felt only by the patient, is difficult to assess and measure, and is a recognizable problem only because the patient says it is there. It is clearly a complex and multifaceted problem, and so defies simplistic attempts to categorize or pigeon-hole cases as "organic or psychological", "real or imaginary", or "physical or hysterical". It is also difficult to provide an objective assignment of the relative weight of all the physical, behavioral, psychological, social and cultural factors that are usually involved.

Chronic pain occurs in about 11-54% of the population in various forms, and can develop without any evident cause, or may develop associated with a stress, or injury or specific illness. In fibromyalgia only 29 of 127 patients (23%) could identify a precipitating event (Greenfield, 1992). The ones that present to Workers Compensation Board are those who relate their onset to a work situation or event, but many people have chronic pain with no consideration of compensation or litigation.

A common scenario in the workplace is an injury, strain, or repetitive task that initiates muscle spasm, aching or pain. The person may have an acute low back strain, or a flexion-extension neck injury ("whiplash"), or painful muscle from overuse of the limb in a work task. These are common-place and usually settle down and clear within a matter of days or weeks, often with no specific therapy. Some others are more severe and may require therapy, but there is still an expectation that it will clear with a specified time period over weeks or months. In a small percentage of people the chronic pain persists long after normal healing should have occurred, and in most instances no pathology or structural changes can be found to explain the persistence of pain (Swanson, 1976). Recent work on plasticity of the nervous system (Wall, 1994), indicates that over time changes can occur in the peripheral and central nervous system mechanisms for sensation and pain, that may result in pain continuing and previously non-painful stimuli to be perceived as painful.

Falling into the group of conditions that may have pain that is chronic are a number of specific pain syndromes (trigeminal neuralgia, bone pain from cancer, reflex sympathetic dystrophy and rheumatoid arthritis, for example), but most people with chronic pain fall into an overlapping group that share many similarities, i.e. fibromyalgia, myofascial pain syndrome, chronic low back pain, tension headache, "whiplash" and tempromandibular joint syndrome. Some forms of chronic pain, as mentioned have a degree of pain chronicity that is compatible with the underlying anatomical disruption or physiological abnormality. This report, however, confines itself to chronic pain that seems disproportionate to the underlying disease process or injury both in terms of the chronicity, the disability and the lifestyle disruption.

In recent years the concept of "chronic pain syndrome" has been defined to understand, study and manage patients with long standing, unexplained pain. The syndrome is defined as persistent pain for more than 6 months after normal healing would have been expected. Although "chronic pain syndrome" is a useful concept to approach the management of chronic pain patients there has been a pendulum swing in its acceptance. Initially it grew in acceptance because it was helpful in recognizing the multiple features of chronic pain, and it de-emphasized the tendency to keep searching for specific causes and specific "cures". The literature in recent years has grown rapidly but recently the influential report of the International Association for the Study of Pain, in the 1994 edition of "Classification of Chronic Pain" decided not to use the term (IASP, 1994). Their rationale was that if there are physical, psychiatric and other aspects they should be specifically assessed and a specific diagnosis applied.

Patients with chronic pain may have localized or widespread pain and tenderness, some with tender points in predictable spots, but with few other physical findings. They often complain of fatigue, sleep disturbance, and limited function. They may have evidence of depressive mood, and exhibit behaviours of chronically ill people. They often search for a single cause of the problem and become frustrated with the medical profession when tests do not reveal a cause and multiple treatment approaches fail to give relief. As time goes on and the symptoms continue, the condition becomes more complex and other factors influence the manifestations, attitudes and symptoms, the chronic pain patient can often be noted to adopt features and behaviours that are referred to as "pain behaviours", and may adopt the sick role and become more limited than one would expect from the physical findings and tests of their function. The approach of medical investigation and treatment, the attitude of family and supporters, and the mechanisms of Workers Compensation Board and social agencies may become important factors by providing "rewards" for remaining unwell, and accentuating the illness behaviour. The person may be quite unconscious of this, but it can be a process that worsens the condition even though the aim of these processes was to help the person.

It is agreed by experts on chronic pain that it is a complex of physical, psychological, emotional, social and cultural factors that interplay to produce and continue this syndrome. This view produces a potential conflict between those attempting to treat this problem and the sufferer, as the patient does not usually like this kind of discussion, and wishes a return to the search for a single pathological cause and an effective treatment. Also, it can be easy to argue against a composite picture as painted above when discussing a patient, as each individual is different, and may disagree with features commonly seen in the chronic pain syndrome. Complicating the picture is the patient's physician, who sees him or herself as the patient's advocate, who may have a concept of pain based on the understanding of acute pain, which is protective, and usually has a specific cause and a logical treatment that often works. If the physician keeps doing more and more tests, and applying more and more treatments with the view to eradicating some unidentified tissue damage, the sick role is accentuated, and the patient becomes more frustrated, downhearted, frightened and insecure.

There is a long experience with chronic pain showing that applying the principles of acute pain is incorrect and unsuccessful. Physicians must be re-educated on this point if these patients are to be managed successfully. The concepts that should be applied recognize that there are complex physical, emotional, psychological, social and motivational issues to be addressed, best done by a multidisclipinary team, and that overuse of analgesics and other medications often lead to dependence, addiction but little pain relief in these patients. An important key is early intervention in the process. This not only means early intervention in the development of chronic pain, but attention to how acute pain is treated so that it does not lead so often to chronic pain. In addition early return to work despite pain is essential, as the likelihood of return to work and a full and active life becomes less likely as the months go by. When it is clear that early intervention is important, the further steps are based on a careful assessment of the problem at that point, coupled with assessment of vocational, psychological and social factors.

Complicating the understanding and management of chronic pain is the confusion and the various schools of thought, often hardened in their positions, that relate to the physical and psychological aspects of the problem, the social and cultural aspects and the approaches to therapy. Such ambiguity results in uncertainty, controversy and suspicion. Suspicion has been increased by the association of chronic pain syndromes with malingering, the increased public scrutiny of social program such as Workers' Compensation, social concerns about worker productivity, and the competing interests of employers and employees in the design of the compensation system (Tarasuk and Eakin, 1993).

Because much thinking is still based on a Cartesian mind-body separation, there is a tendency to feel that chronic pain is either "physical" or "psychological", not recognizing that it is always a combination of the two. As Patrick Wall points out, it is "unwise arrogance" to believe that we can identify all forms of peripheral pathology so our lack of evidence is not necessarily evidence of a lack of pathological change. In addition, a peripheral event may trigger long lasting changes in the nervous system by way of nerve impulses and transported substances that produce a cascade of changes that may persist in the nervous system long after the peripheral pathology has disappeared. Lastly, Wall has pointed out that we are recognizing that the central nervous system is not entirely "hard wired" but kept in the stable state by elaborate, dynamic control mechanisms. These control mechanisms may be altered so they shift into an unstable state, with symptoms such as chronic pain resulting (Wall, 1994).

The management of the patient must be based on an understanding of the complex nature of chronic pain and move away from the acute model. It is imperative that physicians and others recognize that the patients are suffering and are having distress. The patient must be respected, while recognizing the wide range of influences that perpetuate chronic pain. Unfortunately, unless handled sensitively and with good information, the patient perceives that treating them in other than the medical model for acute pain means that the physicians thinks it is "all in my head".

Better outcomes in chronic pain would be achieved if there were a simpler, clear cut compensation mechanism that encouraged early return to work, even if the work is modified or the work changed, assessment by multidisciplinary groups skilled in the management of chronic pain, and lessened antagonism among the various players.

The recommendations for better management of chronic pain patients centre around the education of physicians and other health care professionals; the education of employers and co-workers an modification of the workplace and employment for the prevention of chronic pain and to accommodate the returning chronic pain patient; the use of a rehabilitation approach including early intervention, increased activity and function, and early return to work.

Steps in Better Care of Chronic Pain Patients

1. Recognition of the complex physical, emotional, behavioral, social and cultural factors involved in chronic pain .
2. Education of physicians and other health care professionals about the nature and management of acute and chronic pain.

3. Education of employers and immediate supervisors about modification of the work and workplace for returning patients with acute and chronic pain.
4. Adoption of a rehabilitation approach to chronic pain characterized by:

    a) Better care of acute pain and trauma

    b) Use of normal recovery times for illness and injury

    c) Early recognition of chronic pain characteristics and behaviours

    d) Early intervention when pain exceeds normal recovery times

    e) Use of multidisciplinary teams to manage chronic pain

    f) Stressing the goals of increased activity and improved function even in the presence of pain.

    g) Acceptance of the goal of early return to work

The author of this report agrees with Spitzer (1993) who made five major points about the management of low back pain that could be generalized to the chronic pain patients discussed in this report:

1. Workers with chronic pain should be strongly urged to return to work almost immediately if there are no objective signs found by the clinician who only needs a good history and physical examination to classify the type of problem and decide on its management.

2. Pain alone is an insufficient cause to delay resumption of work.

3. The few patients failing to respond to conservative management should be followed up progressively with standardized diagnostic packages and forceful treatment programs that minimize absenteeism.

4. Our current health system and employer attitudes which encourage a drift towards sick leave for workers with chronic pain should have their strategies radically altered to prevent chronicity.

5. Everything we do as clinicians for patients with chronic pain should be evaluated, or re-evaluated, by well designed and properly executed randomized controlled trials that carefully assess the results of our treatments. The study subjects should be patients and the priority outcome should be return to work.

Spitzer concluded that the hurt of chronic pain was not necessarily harmful, but that chronicity was harmful and could be devastating to the workers and their families. (Also see Melzack, 1989; Liebeskind, 1991; Jareti and Lliebesking, 1994.)

Although the title of this report is related to "Pain", I suspect that we would understand the situation and the patients much better if we concentrated more on the concept and meaning of "suffering". This would help us understand what is occurring to the people, their families, their therapists and all the others who relate to them.

The aim of the medical profession is to relieve suffering. Cassell (1982) reminds us, however, that this may be naive. He states that the public, and patients, feel that the aim of the medical profession is the relief of suffering, but apparently the profession doesn't. Doctors tend to separate the physical and the non-physical aspects of suffering. . Medicine's traditional concern for the body and physical disease, and the widespread belief in the mind-body dichotomy on medical theory and practice, resolves to the paradoxical situation in which physicians may even create suffering in the course of their treatment of the sick.

A football player, injuring their leg, will often accept it without any apparent suffering, and regards it as an annoyance that may impede or end their play in the game. He often gets up, limps a little and then attempts to "run it out". In other circumstances a person may experience leg pain and have associated anxiety and suffering because it is seen as potentially threatening, and with long term consequences. The person may refuse to move, and after periods of rest, when the leg becomes stiff and sore, it increases the feeling that the tissues have not healed, and causes them to rest more, which in turn may aggravate the symptoms and problems and fulfil the prediction that the injury was serious with long term consequences. The person will often express a lot of pain and suffering behaviour which is reinforced by the continuing symptoms, or just the anticipation of movement and pain.

Cassell makes three major points. First, suffering is experienced by persons. Personhood is multifaceted, and includes mind, spiritual, body and the subjective experience. Second, suffering occurs when an impending destruction of the person is perceived, as from any event that threaten the intactness of the person. The third point, and one that I think is often missed, is that suffering can occur in relation to any aspect of the person, whether it is in social role, group identification, the relation with self, body, family, or the relation with a trans-personal transcendant source of meaning. Suffering is ultimately a very personal matter. patients may report suffering when one does not expect it, or do not report suffering when one expects they would.

To try and understand the person, Cassell offers some important points about personhood. A person has a personality and character; a past; a cultural background. A person has roles; exists with other persons and is a political being. A person has a body; has a secret life; has a perceived future; and has a transcendent dimension, and a life of the spirit.

All of these elements of the person are susceptible to damage and loss. What might happen from an injury or illness is not always predictable in the individual. Cassell says that the only way to learn what damage is sufficient to cause suffering, or whether suffering is present, is to ask the sufferer.

Patients suffer when they perceive that there is some threat to their person, they have no control and the pain may not pass. When patients feel that their problem can be managed, and that their pain and distress can be controlled, their suffering is remarkably reduced. A loss of control is an important component of suffering. Cassell concludes that people in pain report suffering when they feel it is out of control, when the pain is overwhelming, when its source is unknown, when the meaning of the pain is dire, or when the pain is chronic. Thus, they perceive pain as a thread to their continued existence, not merely to their lives, but to their integrity as persons. There is some hope in this concept, as we may be able to relieve suffering if we can make the source of the pain known, or change its meaning, or demonstrate that it can be controlled, or than an end is in sight.

Summary of Recommendations

A Concept of Prevention
A Philosophy of Rehabilitation:
    Early Intervention Increased Activity
    Improved Function
    Early Return to Work
Adoption of Expected Recovery Times
Education of Physicians
Education of Employers and Supervisors
Development of Practice Guidelines
Development of a Handbook of Management
Adoption of a Multidisciplinary Approach
Simplification of the Workers' Compensation Process

REPORT ON CHRONIC PAIN

REPORT ON CHRONIC PAIN

Answers to the Questions Posed by the WCBNS

> "Pain is difficult to measure as it varies in degree from one to another individual with similar injury, and evokes differing emotional responses and adaptations in injured individuals. Differing perspectives, priorities and biases appear to affect the opinions and behaviours of those involved: the injured worker and family, the employer, fellow workers, insurance carriers, administrative law judges, attorneys, physicians, other health care providers, and rehabilitation counsellors. These influence decision-making and may actually interfere with medical treatment.
>
> Yet the common goals of all involved is to accurately evaluate and diagnose the causes of the worker's pain and disability, to promote a timely relief of symptoms and resumption of optimal function, to minimize the emotional impact on the injured worker, and to control the costs of the injury, its treatment and its administration."
>
> Harrington, 1992

In this section of the report I will attempt to answer the questions put forward by Workers' Compensation Board. (For the detailed list of questions see Appendix A: Terms of Reference).

The Chronic Pain Syndrome: Is This an Entity?

Everyone understands the nature and significance of acute pain. You burn your finger; you stub your toe; develop a headache; you pull a muscle. There has been extensive physiological study of acute pain, with an understanding that it is protective, accompanied by varying reflex, emotional and behavioral components, and it can be modified by social and cultural factors. When discussing pain, most people, including physicians, think of acute pain and the mechanisms of acute pain. It is not surprising that patients and physicians usually think of pain, even long standing chronic pain, in terms of an underlying cause, and they search for ways to identify and remove it, and use treatments to suppress the pain, and eradicate the cause if possible.

In recent years it has become evident that there are many patients with long standing chronic pain that cannot be understood in terms of acute pain mechanisms. Chronic pain often has no obvious specific underlying local pathological cause that can be identified or eradicated, does not respond to the usual treatments for acute pain, and is associated with complex psychological, behavioral and social factors.

Experience has shown that approaching chronic pain as if it were acute pain is almost always unsuccessful. Rarely is a specific and definable pathological process identified that can be removed with relief of the pain, so repeated CT scans and other tests lead to frustration, increased concern but no useful information, or worse, confusing and misinterpreted information. The usual pain medications are unsuccessful and often create more problems than they relieve. Also, thinking in terms of tissue damage, or an undiscovered pathological process causes one to ignore very important psychological, behavioral, social and cultural factors that are an integral part of this syndrome.

The concept of a "chronic pain syndrome" has recently been argued. The chronic pain syndrome has been defined as pain persisting 6 months after healing and recovery would be expected, if there is a definable trauma, or 6 months after the onset, in the absence of any definable ongoing pathological process. Recently it has been suggested the label "chronic pain syndrome" not be used (IASP, 1994).

After a period of general acceptance of the term, particularly in the medical literature from the United States and Canada, the task force on "Classification of Chronic Pain" of the International Association for the Study of Pain (IASP, 1994), decided to back away from the term. Their argument was that the syndrome recognizes the presence of the many factors, but might evade the requirement for accurate physical and psychiatric diagnoses. Although the IASP agreed that chronic pain was quite separate from acute pain, and was a unitary phenomenon experientially, they still argued there may be more than one cause and the causes may vary in importance. The IASP also felt the term was used pejoratively.

The IASP discussed their decision to move away from the term under "Some Controversial Issues" but this may create more problems than it solves. For instance, it tends to emphasize the requirement to continue to search for specific diagnosis in patients with chronic pain when the pressure should be to get on with its management. The use of the term chronic pain syndrome does not preclude making specific diagnoses of the physical, psychiatric, behavioral and other factors present, but does emphasize that overconcentration on the specific aspects may sideline and obscure the major goals of management. However, in this report the concept of chronic pain will be used generally and reference to chronic pain syndrome will only be to writers who used this term in the past or to the specific questions WCB asked about the syndrome.

To understand the condition of chronic pain better, it is helpful to think in terms of "suffering". I say this because the word "pain" evokes the concept of acute pain, when it is clear that these patients are suffering, and that the suffering is often painful, but that there are other components of suffering as well. They are suffering with disturbed sleep, negative mood and sometimes depression, feelings of insecurity and lowered self worth, and feelings that they are severely impaired, even more impaired than they obviously are. They have behaviours that are in keeping with the "sick role", often manifesting behaviours and appearances that communicate how ill and pained they are. These patients have complex suffering, often with pain, and sometimes suffer from the anticipation or fear that actions or activities will precipitate or worsen the pain (Cassell, 1984).

The Relationship and Categorization of Pain to the Medical Recovery Process Following Injury

It is to be expected that pain would be an important variable in the recovery process following an injury. An acute injury is usually associated with tissue damage, tissue repair and ultimately healing. There is a "normal" time course for tissue repair and healing which will vary with the site of damage, the degree of damage, whether incomplete or irreversible, and the type of tissue involved. One aspect of pain recovery is the personal response to pain. This has features that relate to the kind of injury, the circumstances surrounding the injury and its significance to the person, cultural differences in response, and various extraneous factors such as secondary gain.

Other factors include the anatomical location, and the emotional response to the kind of injury. For instance, individuals are much more sensitive and aware and threatened by injuries around the face, and may be impaired longer if the injury occurs to a weight-bearing joint, an eye or hand, than if a similar degree of trauma and tissue damage occurred in another anatomical site. It goes without saying that injury that results in pain will tend to have a slower return to normal function and activity.

Tissue damage and pain are often associated, but not always proportional. For instance, some severe injuries with a lot of tissue damage may be accompanied by moderate and well tolerated pain and discomfort in some individuals, whereas minor trauma which may not even be visible, may cause another person distressing discomfort and pain (Arinoff, 1991). There are legendary stories of soldiers charging ahead despite severe multiple wounds, later indicating they felt no pain at the time. Football players, pilots and most professionals often minimize trauma that would be expected to be painful, and wish to return to work early, arguing that they are recovering rapidly.

Pain is categorized as acute and chronic, and this has direct relevance to the relationship to the recovery process. In an acute injury, acute pain is normal and expected, particularly in the early stages of trauma and tissue repair. Chronic pain may persist when recovery has not occurred and the pathological process continues, or when a series of factors create a situation in which pain and suffering continue in the absence of any evidence pathological process or tissue damage. In that situation it is felt that recovery has not occurred, not because there is evidence that tissue damage has not repaired, but because the symptom of pain persists.

The Relationship of Chronic Pain Syndrome to Workplace Exposure, Process, Trade or Occupation

Chronic pain patients who relate their problem to the workplace fall into three categories:

1. Those that relate the onset to a work injury or event,
2. Those that develop chronic pain they believe is due to work related activity, but with no acute event, and
3. Those that have chronic pain of uncertain cause that is aggravated by work activity.

The chronic pain developing after a workplace injury is defined as persistence of the pain without any identifiable pathological change to explain the persistence of pain, continuing 6 months after recovery would have been expected. Those that develop chronic pain at work but unrelated to an event, are defined as having the chronic pain for more than 6 months. The last group are those who develop chronic pain, often over a very long period, but they begin to notice that work activity is aggravating their problem.

In some instances an accident, repeated trauma or "repetitive strain", associated with a task, is related to the onset of the pain. As time goes on, however, the pain becomes more chronic and widespread, and persists even when the person is not involved in the task. Many of the chronic pain syndrome patients do not have an accident, or injury event that they can distinctly relate the onset of their problem, but instead, have gradual onset of chronic pain that is inferred to be due to work. This seems to be confirmed by the increasing pain associated with continuation of physical effort and work. The relationship of pain aggravation to the effort of continuing employment leads to the logical conclusion that work should be reduced or stopped, and the chronicity increases because any attempt to return to work aggravates the pain. This is a cycle that has to be altered.

The relationship to the workplace is confounded further by the recognition that many people with do not make an association of this with the workplace, and have no claim for compensation. In the practice of most physicians, many cases of chronic pain they see are not related to compensation or litigation. The association of pain aggravation and persistence associated with compensation has been over-emphasized in the past.

A more complicated concept is related to pain proneness. It has been argued that some people are prone to chronic pain and that it might occur in the individual whether or not they were in their employment, and therefore the development of chronic pain could be said to be incidental to employment. This idea has also been over-emphasized in the past (Lynch, 1993) and has been unhelpful as a concept when addressing the important decision surrounding chronic pain. At the very least, this might constitute the psychological variant of the "thin skull principle".

Conditions Associated with Chronic Pain and Relationship to the Workplace

Many conditions can produce pain, and develop into chronic pain, but for simplicity purposes they can be grouped into two large groups. The first is that of specific syndromes, a large group of specific conditions that may become chronic such as herpes zoster, reflex sympathetic dystrophy, trigeminal neuralgia, migraine, phantom pain, etc.

The second is chronic pain resulting from a group of musculoskeletal pain disorders. This group tends to be the most challenging and perplexing for the patients, physicians, Workers' Compensation Board and the legal system. This group includes conditions often referred to as fibromyalgia, fibrositis, myofascial syndrome, cervical strain, chronic low back pain, whiplash, repetitive strain syndrome and chronic tension headache. These are common in the population, and are as more often unassociated with the workplace or compensation.

Attempting to classify and designate specificity in these musculoskeletal syndromes has been difficult, and there is so much overlap that one might consider them all as variants of the same process, whether developing chronically, or related to an acute event. Although there is still a tendency to separate syndromes such as fibromyalgia, myofascial syndrome, cervical strain, chronic low back pain, repetitive strain injury and chronic tension headaches, they may be variants of the same process. Jeffrey Thompson of the Mayo Clinic in 1990 argued for unifying conditions with separate diagnoses under one conceptual framework called "tension myalgia". So far, this has not had wide acceptance (Thompson, 1990).

Nachemson (1994) argued that predictors of chronic pain include dissatisfaction in the workplace, and lack of a sense of control. He indicated a strong predictor of chronic pain was positive responses to questions that assessed how the person felt about and communicated with bosses, fellow workers, and the job. This may apply to some but there are other studies that show the vast majority of disabled workers want to return to work.

Karasek and Theorell (1990) postulated a "job strain" model to assess the psychosocial characteristics of workers and the workplace. The job strain model proposes that workers at greatest risk are those whose jobs place high demands on them but give them little control, and little personal support. They include assembly line workers, nurses aids, key punch operators, garment stitchers and others. Workers with high demands and low control also have more illness related absenteeism and a greater risk of other disorders such as coronary heart disease. In contrast, "healthy work" is that which allows people to use and develop their skills, to participate in decisions surrounding their work and their workplace. This has important implications to management in other ways, as it also appears to increase productivity.

Uncertainty and suspicion were two factors that shaped worker responses to their injuries, and some of this was centred around the workplace and the attitude of fellow workers and employers. Because there is a lot of uncertainty surrounding low back pain, fibromyalgia, and other causes of chronic pain syndrome, there tends to be a sense of suspicion by all who relate to the person with chronic pain, and whether it is real or serious. The lack of objective evidence and the uncertainty increase the potential for resentment by workers and employers, and accentuate the problem for the patient. The likelihood of long term pain can be reduced by early intervention or by a health professional who early indicates the job is waiting, shows compassion, and reduces fear and concern.

A Relation of Predisposing Medical Conditions on the Existence, Duration and/or Severity of Chronic Pain Syndrome

Robins and co-workers (1990) studied whether increased body awareness and illness worry might explain the distress and disability expressed by patients with chronic pain. They examined 20 patients with fibromyalgia and compared them to 23 with rheumatoid arthritis and looked at measures of depressive and somatic symptomatology, pain, disability and amplifying somatic style. The fibromyalgia patient has greater somatic symptomatology, equivalent levels of pain and less physical disability than those with rheumatoid arthritis. There was no difference between the two groups on body awareness or illness worry. Illness worry correlated highly with symptomatology for both groups, but with physical disability only among the fibromyalgia patients. Their results suggest that disability in functional somatic syndromes may be determined by patients worry about having a serious disease. Feelings of vulnerability and apprehension about having an illness of unknown origin can contribute to activity limitations in fibromyalgia patients, and to their degree of somatic distress.

There are few if any common definable medical conditions that would predispose one to workplace injury induced chronic pain. However many have argued that psychological and situational features (job dissatisfaction, marital problems, alcoholism, job insecurity, etc) may make one prone to continuing symptoms if an injury occurred.

Although the worker with chronic pain is usually only interested in what damage occurred to cause the pain, and what can be done to relieve it, researchers have noted that they have other features that may be helpful in understanding why this small group of people don't "heal", and continue to have pain and suffering. They have more complaints about body symptoms in general, and are apt to be more concerned about symptoms generally. They have more migraine and tension headaches, colitis and other problems. They are noted often to romanticize how good things were before the problem occurred, but it has been noticed that many have been dissatisfied in their jobs and had problems in their personal lives. They may have symptoms of mild depression to some degree, and a history of depression more often in their past. Conversely, it has been noted how infrequently this syndrome occurs in people who get a great deal of satisfaction and pride from their family and jobs. Of course, these are generalizations from studies of groups, and may not apply to individuals, who are, after all individuals.

The Role of Secondary Gain on the Duration and/or Severity of Chronic Pain

Secondary gain is often raised in relation to persistent symptoms and chronic pain. It is evident that individuals minimize pain and return to work sooner when they feel there are only negative results from continuing illness and debility. If they are enthusiastic about their job, and see a lot of negative aspects, with no rewards for being off work, they wish to return. If, however, there are a lot of rewards, often subtle and unconscious, for being off work and having continuing symptoms, recovery may be slower and return to work delayed. Unfortunately, the current process of our medical system often provides rewards for being ill with fewer for getting better. We give greater attention to those who complain most, we give medications to those with more symptoms, we give them more care and tests, show them more concern and provide more support. They are given a reason for not working or carrying out their responsibilities. Fordyce (1988) developed the operant conditioning approach to treating chronic pain which attempts to remove the rewards for being ill and complaining, and substitutes rewards for getting better, complaining less and improving function.

Secondary gain is a difficult area of discussion with patients, because they see their problem in terms of injury and pain, and secondary gain if present is unconscious, and tends to be unrecognized and denied. It is a difficult topic because secondary gain is a part of virtually every pain situation but we don't like to recognize these features in a pain experience. We all have elements of secondary gain in any pain situations and the question is the type and degree of secondary gain manifestations. It tends to be recognized only when it is excessive or exaggerated and the actions or behaviour seem out of keeping with the underlying problem, or when the goal of the behaviour seems evident. It can be argued that secondary gain is an element of the environment in which the pain problem occurs, rather than being an element of the person.

Unfortunately, the recognition of secondary gain raises in some people's mind the question of "faking", malingering, or outright fraud. The assignment of percentages of physical versus psychological including aspects of secondary gain, is so clouded with subjective inconsistency that it raises many questions about the attitudes of the examiner as it does about the patient. Because malingering is unusual in this setting, the patients are generally unaware of the nature of their responses and behaviours, and greatly resent discussions and declarations on the level of their secondary gain. This increases the resentment and antagonism in a situation which should be nonadversarial.

It should also be recognized that there is a "psychological thin skull" as well as the physical one. The principle of acceptance of the physical thin skull syndrome in patients who are more liable to injury because of underlying physical change should also apply to people with varying psychological and psychosocial background.There are individuals who will become more distressed by an injury or by pain, and who may cope less well.

Is There a "Usual" Sensitivity to Pain, an Innate Ability to Tolerate Pain, or Motivation

Like most physiological phenomenon, one can find a range of function or response into which most people would fit. This would then be defined as a "normal" response because the vast majority of people respond in that fashion. It may seem odd to refer to people who can see much better, run much faster, hear more acutely and remember more complex material as being "abnormal", but they may fall out of the "normal" range.

In speaking of "usual" sensitivity to pain, the concept is usually about acute pain and derived from acute pain experiments. One can show some variation between individuals, and this sensitivity to pain, the threshold to pain and the tolerance of maximal pain, can be varied by a number of factors including medication, suggestion, and emotional factors. There are some aspects of pain that are innate and there is the unusual situation of congenital insensitivity to pain and sensory syndromes associated with remarkable reduction in sensitivity to pain including congenital sensory neuropathy and leprosy. On the other hand, there are individuals who may have normal sensitivity to pain on acute experiments, but who emotionally tolerate pain very poorly. Even minor painful conditions, or the threat or anticipation of pain may cause great distress and anguish in these people.

It was a mistake to think that there is a "correct" amount of pain. The error occurs if we believe that there is a uniform response to a given injury or pain stimulus (McGrath, 1987, 1989).

Are "Usual Recovery Times" Valuable in the Identification of Chronic Pain Syndrome?

Usual recovery times are helpful because they allow us to recognize that recovery is occurring as expected and without evident complicating factors. An additional reason for using a concept of "usual recovery time" is the recognition of a patient who is developing the features and characteristics of chronic pain early as possible. This early signal would allow early intervention to prevent that disabling process from developing. Unfortunately, appropriate steps are often taken only when the chronic pain has been present for a very prolonged period, when it is difficult to manage and reverse, and when the likelihood of return to work is poorer.

Guidelines developed for "usual recovery times" or "duration times" (the term used by the Alberta Workers' Compensation Board) give an estimate of the average time required for workers to return to work after various work related injuries and treatment. They list a number of conditions and give the minimum and maximum time for return to work. The maximum time is not necessarily a definite return to work date, but rather the time when questions should be asked as to why the worker has not returned to work (RTW). The questions can be answered by medical reporting or by independent examination. An example is as follows

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Cervical Sprain or Strain
(Whiplash or Non-Whiplash Soft Tissue Injury Without Nerve Root Involvement)

ICD-9 CODE	JOB CLASSIFICATION	RTW MIN/MAX
723.1	Sedentary Work	0 - 4 weeks
	Light Work	0 - 5 weeks
	Medium Work	0 - 6 weeks
	Heavy/Very Heavy Work	MA opinion based on medical reporting if layoff exceeds 6 weeks

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Alberta Workers' Compensation Board, Duration Guidelines

Such a guideline for return to work for chronic pain could be developed but it would actually be two different groupings of return to work guidelines. The first would be the return to work guidelines for a series of acute injuries, and the second would be an expected recovery time and return to work guideline for those that had continuing pain.

One recent classification of disability for low back pain could be applied more generally to musculoskeletal injuries in the workplace (Krause and Ragland, 1994).They proposed an 8-phase classification system primarily based on the duration of work disability, and which takes into account other biomedical, developmental and social characteristics of work disability resulting from low back pain. The classification shown in a figure (see below) and outlines the various timing for each phase. This is a useful concept because it indicates the appropriate approach to be taken at each stage, and triggers early movement into a rehabilitation mode if the process is continuing. In their paper they outline the definition of each phase and review the background evidence for the condition at each phase.

What Medical Evidence and Objective Medical Findings are Necessary or Helpful in Determining Chronic Pain Syndrome?

Unfortunately, there are few features of chronic pain syndrome that can be termed "objective" in the usual sense. There have been attempts to objectify elements such as the identification of trigger or tender points and behavioral responses (Waddell Scale, 1988), assessment of function; severity of pain (Pain Scales) and the depression-anxiety features (Beck Inventory, etc), but they are coloured by subjective aspects and motivational influences. Thus the answers to this vexing and problematic condition that affects so many people and challenges all associated with these patients cannot be found in simple, reproducible tests or assessments.

It is possible to diagnose the condition when patients have widespread musculoskeletal pain for 6 months beyond normal healing times, and have characteristic point tenderness in cases of fibromyalgia and the other musculoskeletal pain syndromes, but specific determination of the degree that any associated or predisposing factor may have in the development or aggravation of the chronic pain is too unreliable and subject to bias to be helpful or fair in the determination of compensation scales and percentages.

As mentioned earlier, chronic pain syndrome compromises many clinical conditions and causes and it is recommended that these be addressed individually.

Compensation and Chronic Pain Syndrome

The development of no fault compensation to provide support for injured workers in return for giving up the right to sue employers developed early in this century, was an important social advance and was, as Ron Ellis (1994) stated, "not just financially smart for workers, employers and the state, but it was also morally right and just".

Although a right and just system, it may be a factor in the duration and outcome of injuries, and of chronic pain. It has been noted that increasing compensation rates increased the number of claims. It has also been noted that in various conditions, those with compensation have more serious complaints despite not having greater disease, but have more prolonged periods of recovery, use many more services, and have a lower rate of return to work. It is a difficult issue, particularly in the individual case, but the compensation system can be one aspect that complicates the rehabilitation and return to work of people with chronic pain. (See section on Compensation/Litigation.)

As noted by Tate (1992) several factors influence the rate of return to work by workers who receive disability benefits. These include the disability benefit system per se, labour market conditions, the employing company and type of work, the timely provision of vocational rehabilitation services and workers disability and demographic characteristics. Variables such as age, sex, education, occupation, amount of wage replacement and type of disability are predictors of the return to work outcomes. A worker is more likely to return to work if they are younger, single, with higher education and in a professional or managerial type of job. Also, studies have shown that where a person's wage replacement exceeds 75% of their former wage, return to work becomes less likely (Tate, 1992).

The issue of compensation and chronic pain has serious long term implications. It has been noted that the number of claims for low back pain and chronic pain are increasing in many countries, far beyond the increase in the work force. Indeed, Nachemson (1994) suggested that the rising claims for low back pain may signal the end of the welfare state in Sweden, and Aronoff of the Boston Pain Center strongly warns of the "chronic pain and the disability epidemic" in the United States which is threatening their system. (Aronoff, 1991)

The influence of compensation on claims and outcome in chronic pain are not agreed by all. Terence G.Ison in his book, "Compensation Systems for Injury and Disease: The Policy Choices" disagrees with those who argue there is a strong influence of compensation and claims processing on the course of disability (Ison, 1994). Ison, a professor of law at Osgoode Hall in Toronto argues that more significant variables include the nature of the disability, vocational opportunities, the capacity of the medical profession in diagnosis and treatment, premorbid job satisfaction, family support, and other cultural, personal, environmental and economic factors. He would agree, however, that there are some instances in which compensation claims may be a factor of importance, and a few where it may be a major influence. He says that most injured workers want to overcome their problem and return to work. There are two small subgroups who may cling to their disabilities as a source of income:

1. Those who want to work but have no prospect of employment. This group is large when unemployment is high.
2. Those who are worn down and no longer fit for the manual jobs that have been their lifestyles.

He points out that the last group may find that a compensation claim is their only prospect of avoiding welfare, as an injury may prevent them from carrying out their normal work, it is too early for retirement, and they are not suited for other lighter work. Ison says that to apply a label of "monetary gain" or obvious "secondary gain" to the people in these groups serves no curative purpose, and may even increase their problems and stress. One could argue that the real problem is a system that cannot adapt to allow these individuals to be productive.

Ison cautions that much of the anecdotal evidence for a wide spread incidence of monetary gain comes from specialists who see a small preselected sample of hard cases. He states that physicians who see a more representative sample of Workers' Compensation claimants state that the majority want to recover and return to work and a minority (probably about 10%) do not.

Another controversial view relates to the belief that if monetary gain is widespread, settlement of claims should relieve the symptoms. There is a lot of evidence that problems continue even following settlement, but others argue that perhaps the symptoms have become entrenched. The weight of evidence would suggest that the symptoms generally continue (Trimble, 1981) (Mendelson, 1982).

This report does not put forward policy suggestions for how WCB should address the problem of chronic pain but advocates that whatever policies are developed recognize the complex, interrelated nature of the problem and develop a system that is efficient and nonadversarial, so the rehabilitation program can get on with the important goal of assisting the person to improve function and return to work. A complex, prolonged and adversarial process will aggravate and prolong the distress and encourage behaviours and induce anxieties that worsen chronic pain.

Can We Apportion Cause Between Injury and Other Causes of Chronic Pain Syndrome?

It is not practical or reasonable to apportion cause between injury and other causes of chronic pain syndrome in a specific case. Only a third of patients with chronic pain relate the onset to trauma or injury and the differences between those with and without compensation or litigation may be due to those processes rather than trauma or other contributing causes.

Patients with chronic pain related to injury may have associated factors (job dissatisfaction, high pressure -low control jobs, marital problems, increased concern about body symptoms, etc) that may be regarded as "causes" in others who do not relate trauma to the onset of their syndrome. But to assign percentages of cause to these complex inconsistent variables, some of which may result from the chronic pain syndrome, is not practical or reliable.

It is reasonable to accept that chronic pain, even if initiated by injury, is a complex of physical, emotional, behavioral, social, cultural and motivational features. If apportionment used a general approach it could be applied, but to tease out percentages in the individual cases is impractical.

Can We Categorize Cases as Primarily Organic or Primarily Psychological?

In the past it was tempting to try and categorize conditions, particularly complex conditions, as either organic or psychological, but that is simplistic and naive. Depression, regarded as a psychiatric disorder, has biochemical, neurological and physical features. A broken leg on the ski slopes has important psychological, behavioral, social and cultural features. It is hard to think of a condition that is not a composite of organic and psychological features.

Unfortunately, any attempt to arbitrarily assign percentages to each type of injury or condition would engender some argument, and likely no one would be happy with the conclusions. Is chronic low back pain, or migraine, or "whiplash", primarily psychological, primarily organic, or a mixture? I suspect we would find some who believe in each categorization.

Fibromyalgia is a good example of a chronic pain disorder that has complex and poorly understood physical, neurochemical and psychological components that we could not easily separate out. Fibromyalgia patients have multiple body symptoms in multiple functional systems with no clear organic cause (Yunus, 1981). People who have increased body awareness more often perceive that these are threatening. Those that are attentive to their body symptoms report many more physical complaints and psychological symptoms. Fibromyalgia patients experience musculoskeletal sensations as more noxious intense and disabling because of unusually heightened awareness of body functioning, Robins (1990) speculates, "exaggerated worry about having a serious illness may also lead fibromyalgia patients to restrict activities and mislabel new bodily sensations to confirm feelings of vulnerability to illness." People who worry about being ill tend to think they are particularly vulnerable to diseases, and remain convinced of illness even after being reassured by their physician, and continue to report more symptoms and greater levels of pain that have no physical explanation. These patients also report more impairment when they have an illness. They found that fibromyalgia patients were more likely than rheumatoid patients to consider themselves sickly all their lives and to have given up work or usual activities at some time because they were not well. These features don't however, indicate anything about the underlying pathology of the disorder, only aspects that may color the response.

Can we then decide if chronic pain is "primarily", or "mostly" one or the other? It is possible to do so only in a general way, but that may be more practical and reasonable than to try and make a percentage determination of how much is organic and how much is psychological in an individual case. Thus one could categorize in a general way, but it might not apply to individuals, who come with their own complex of family and experiential background, emotions, psychology, motivations, hopes and relationships, and who may have physical illness that varies in severity and symptoms. One person with an injury may ignore the discomfort and return to work, while another with a similar injury may complain bitterly to everyone in sight, and stay off work, attending physicians offices and requesting treatments and investigations. Both have a mixture of organic and psychological components, and it is only possible to suggest what would be a reasonable response and outcome, with an expected prognosis in usual circumstances.

There has been discussion and controversy about whether fibromyalgia exists as primary and secondary types. In the primary type stress and emotional factors, coupled with behavioral and social factors can produce a syndrome of muscle pain and tenderness, depressive mood and sleep disturbance. In secondary fibromyalgia some underlying pathology such as rheumatic disease, thyroid malfunction, serious psychological disturbance, trauma, repetitive work or migraine may combine with psychological and social factors to produce the same constellation of symptoms (muscle pain and tenderness, depressive symptoms and sleep disturbance). Many now believe that there is usually some identifiable psychological, medical, occupational or traumatic process that explains why the person has the syndrome, indicating that all cases are essentially secondary, and related to a host of factors. Recently the designations "primary" and "secondary" for fibromyalgia have been dropped.

Robins comments "The finding that fibromyalgia patients, while not severely disabled on objective measures, none the less continue to report pain, inability to work, and varied somatic distress inconsistent with clinical observations. Claims of pain, fatigue and the inability to sustain a work effort among fibromyalgia patients who are fully functional on conventional tests contribute to the conflict and indecision rheumatologists experience when asked to judge the compensable disability of these patients. Questions of compensation for fibromyalgia sufferers may never be adequately answered until unambiguous methods of measuring pain and/or work capacity are developed. In the absence of such tests, our results suggest that illness worry may account for some of the observed disability in fibromyalgia".

RECOMMENDATIONS

RECOMMENDATIONS

A Concept of Prevention

We are always going to be late in dealing with the problem of chronic pain until we accept that there must be changes in society, in the workplace, in the approach to treatment and compensation that emphasizes **a preventive approach**. Most approaches to date have been related to the person with chronic pain, but the opportunity is in the prevention of the problem. Preventing problems that have not happened never gets our attention as compellingly as the presence of the problem but I implore employers, unions, physicians and the Workers' Compensation Board to step back from this problem, take a more visionary (and less confrontational) view and see how we can constructively approach the prevention of chronic pain. Current knowledge is incomplete, but it is adequate to begin to take initial steps.

- Social attitudes to workers on compensation and to the unemployed must be more under standing and concerned, with less prejudice and disrespect.
- Employers and supervisors have to take a positive and preventive approach to safety, morale and lifestyle flexibility in the workplace. They will have to take steps to encourage workers to return to modified work situations, and develop support programs for injured workers returning to their employment.
- Physicians must learn a more appropriate way of dealing with acute injuries and pain, recognizing the early stages of developing chronicity, and develop an appropriate approach to chronic pain with early intervention based on rehabilitation concepts.
- The compensation agencies should take a more proactive role in education at all these levels. There should be more understanding of the complex issues that underlie compensation, litigation and unemployment.

A preventive approach is more humane, and ultimately more cost-effective than the current process of dealing with problems after they have occurred.

A Rehabilitative Philosophy

A rehabilitative philosophy must be brought to the assessment and management of chronic pain when it develops. Commonly an acute pain concept and medical approach is used. This approach attempts to identify a pathological process producing tissue damage, and to find a treatment to repair the damage and cure the problem. Such strategies for acute pain, such as the heavy use of investigation and consultations and treatments with medication are often counterproductive and encourage the chronicity of the problem. Rather than promoting improvement, the acute model leads to overtreatment, and over investigation. It tends to accentuate the anxiety and fear about missed underlying pathology, encourages sick behaviour, and drug side effects of lethargy, physical dependence and depression.

The new goal becomes improved function despite continuing pain. Another goal is return to work, perhaps in the presence of continuing symptoms. Another goal is improvement in the symptoms, but recognizing that cure may not occur.

Adoption of Expected Recovery Times

A number of jurisdictions have developed and utilized expected recovery times. Although these are sometimes difficult to develop and difficult to apply, they are important as they serve as early signals when a worker is having more difficulty than expected, or not recovering well. In chronic pain it is crucial to intervene early and expected recovery times would trigger early intervention.

Education of Physicians

Physicians are not as well educated about the appropriate management of acute and chronic pain, and better understanding by physicians would undoubtedly lead to improved outcomes. Physicians are also sometimes confused about their appropriate role, as they act as the patient's personal physician, their advocate, evaluator of their disability, and provider of medical information to compensation, insurance and other agencies. The Ontario Medical Association is taking a new approach by having the physician provide objective medical input to the employer, who creates opportunities for the disabled employee to return to the workplace.

McBride and Devlon commented that physicians currently are placed in a policing role for which they are ill equipped and uncomfortable. They do not have sufficient information about the workplace or the options for modified work. They may not understand how medical restrictions relate to the ability to do work. The physician cannot objectively assess the psychosocial components of the ability to work, and has difficulty objectively evaluating conditions for which there are few confirmatory diagnostic signs. In this current setting McBride and Devlon point out that physicians tend to approve absences until patients are fully recovered which increases the cost to employers. Perhaps the OMA Program will develop a more collaborative arrangement between the worker, the physician and the employer, and encourage a responsive workplace program that encouraged workers to return, even if in a modified employment.

Consideration should be given to further separating the roles of the patient's physician as director of the patient's care and as advocate for the patient, from the evaluation. The physician is often put in a difficult situation between the patient and the Workers' Compensation Board. This similar awkward position may occur with insurance companies and the legal system in other situations. The physician's role is to care for the patient, but these agencies require the physician to act on behalf of the agencies in a way that may bring him or her into conflict with their own patient. It is of interest that the physician staff of the University of Washington Pain Clinic refused to do such evaluations, seeing it as an interference with their care of patients. They also argued that disability ratings, and decisions about compensability and non-compensability were not medical issues. Although this could be debated, there is no question that the physician feels pulled in two directions.

Harrington (1992), in outlining the methods of accurate examination for pain disorders in the injured worker, noted that most physicians have not been given much information about chronic pain in their training and postgraduate education. This contributes to delays in diagnosis and treatment, prolongation of worker incapacity and often avoidable controversies in the determination of temporary and permanent disability. He encourages the education of physicians in the diagnosis of pain disorders, so as to promote proper management, the avoidance of expensive, sophisticated diagnostic tools, such as MRI and CAT scans, and an early return to a productive life.

> "For the family physician and, indeed, most specialists, the prospect of managing the patient with chronic pain syndrome does not usually evoke feelings of enthusiasm, competence, or success. More likely are feelings of inadequacy, cynicism, or outright hostility".
>
> John C. Clifford (1993)

The Workers' Compensation Board should be more actively involved in the education of physicians about these important medical and social problems by sponsoring, encouraging and designing conferences, workshops, written materials and interactive computer programs to assist in the continuing education of physicians about chronic pain and its management.

> "Most physicians are accustomed to treating acute injuries that rapidly improve. And most don't know what to do with the chronic pain patient who has no evidence of residual structural deformity or disease. Patients with no measurable anatomical, physiological, or biochemical evidence of functional impairment who continue to feel pain despite rational treatment regimes are a major cause of frustration, burn-out and cynicism in today's health care professionals. This is particularly true of the health care professional who continues to look for a rational, mechanistic solution to the problem. To most of us, our inability to resolve the problem is merely a function of the lack of appropriate knowledge. Traditional medical thinking assumes that when our knowledge is more complete, we will be able to pinpoint the molecular problem, apply the appropriate therapy, and correct it. Part of the dilemma we face, however, in "understanding" chronic pain and suffering is understanding "ourselves".
>
> Edward R. Chaplin

Education of Employers and Supervisors and Workers

A great deal could be done to improve the return to work of injured workers with chronic pain if there were improvements in the workplace. This would include security for the person's employment, there was an ability to modify employment during the recovery phase, and a positive attitude towards the injured worker by the employer and the fellow employees.

The OMA position paper has outlined a fundamental change for the role of the physician and for the attitude of the employer and the workplace. The injured worker and management would have responsibility for developing a timely return to work program using input from the physician. The employer offers the employee a plan to return to suitable work in a timely fashion. The worker brings this to the physician. The physician provides information of functional limitations, restrictions and abilities and other advice for the worker. Information to the employer is provided through the worker. As McBride and Devlon point out, for the OMA model to be successful, a credible workplace program founded on good will and trust and offering productive work options must be in place.

More effort must be made in the workplace to make reasonable alterations and concessions to allow the worker to return. The worker may need modification of time, or modification of the task, or on some instances even a change of job to allow them to return to a productive work life.

Rehabilitation of chronic pain patients is worsened by insecurity about their job, by a inability or resistance of the employers, foremen, or fellow workers to modify the person's work, or if those in the workplace have a negative, disdainful or cynical view of the injured worker (Linton, 1991).

Much can be done by the development of educational materials, workshops and conferences on this concept, and particularly by the personal liaison of field workers. Top of Page

Development of Practice Guidelines

In recent years the development of standardized protocols and guidelines has become common and the mechanism for their development very sophisticated. Although initially for medical and surgical conditions there was some concern that standardized protocols and guidelines would become "cookbooks" and possibly used to limit and penalize physicians, this has not happened. They have been helpful and beneficial and will continue increase in the practice of medicine.

It would be strongly advised that a practice guideline be developed for the management of patients with chronic pain.

Clinical practice guidelines, although they were initially controversial and made many physicians nervous because of a concern that they would limit their decision making or provide "cook book medicine" have become increasingly important and accepted. Guidelines are now being developed by most major medical organizations in North America, lead by the American College of Physicians, and more recently by the Canadian Medical Association. The Canadian Medical Association document "Guidelines for Canadian Clinical Practice Guidelines", (1994) outlines the philosophy and the methodology, and should be used, along with other documents from the American College of Physicians in the development of a guideline for the management of acute pain, and for the treatment of chronic pain. It is important that such guidelines be developed by physicians who are experienced in these areas and who will be affected by the recommended interventions and guidelines. It is also recommended that representation include not only the relevant expert groups, but also patients and other health care providers that are appropriate. Recently the Nova Scotia Medical Society has indicated their support for the development of such clinical practice guidelines (Zitner, 1994).

Handbook of Management of Chronic Pain Patients

As part of the work on a protocol, a handbook of management of chronic pain for physicians would be useful. This would be a well written, illustrated monograph of about 50-60 pages, outlining the current understanding of chronic pain and suggested guidelines for investigation and management. This would be based on the previously mentioned practice guidelines. Top of Page

A Multidisciplinary Approach

There are many studies indicating that the best results in chronic pain come from multidisciplinary approaches. One approach, the Rochester Model, is a conceptual model of work disability. The Rochester Model proposes that work disability is a function of a complex interaction among medical status, physical capabilities, and work tolerances in relation to work demands (biomedical, metabolic, psychologic) in addition to psychosocial factors such as worker traits, work style, psychological readiness to return to work, and ability to manage pain or symptoms. This conceptual framework proposes that the injured worker's perception of functional capabilities and the environment in which he or she works can significantly affect return to work outcome. Multidisciplinary approaches use various heath professionals for the expertise they bring to the problem, and a varied approach to manage the complex issues involved in chronic pain. Fewerstein et al (1993) in a multidisciplinary unit using the Rochester Model had 74% of the patients with upper extremity pain disorders returning to work or in vocational training in contrast to 40% of a control group. For those who returned to work, 91% of the treatment group were working full time in contrast to 50% of the control group.

The importance of a multidisciplinary approach is that it addresses many of the complex aspects of chronic pain. Approaching chronic pain with only one focus has a long history of failure. However, it is simplistic to believe that any approach, if it is multidisciplinary, is likely to succeed. There is still a great deal of research required on the various aspects of the multidisciplinary approach, and determination of which components are successful and necessary for the overall success. It is certainly possible to include within a multidisciplinary concept many expensive and needless therapies and therapists, and the requirement for research on these aspects is greater than ever. A review of the diversity among chronic pain centres showing the varied array of approaches and services is reviewed by Csordas and Clark (1992).

Evaluation

Part of the approach must be careful research and evaluation of all of the above. This would be an integral component of all the above recommendations. Evaluation would indicate we are reaching the goals we set out and direct the process of improvement in reaching these goals. Top of Page

Workers' Compensation Process Simplified

As mentioned earlier, we specifically resist indicating what the WCB should develop as policies as that is the role and expertise of others. However, whatever process is developed should be clear, simplified, and widely understood.

The process should emphasize the importance and therapeutic benefits of increasing activity and early return to work. The process should de-emphasize a continuing acute medical model for ongoing chronic pain, and early institute a rehabilitative approach, with clear milestones in the management and assistance in returning to work.

Lastly, the process should emphasize the important goal of returning the worker to the workplace in an atmosphere of trust and respect. The current atmosphere in the system has an air of negativity and cynicism that only increases the distress of workers.

Part 2

LITERATURE REVIEW

SELECTED LITERATURE REVIEW OF CHRONIC PAIN

INTRODUCTION

In this review the term "chronic pain" refers to a situation in which the symptom of persisting pain has continued long past the time that normal healing would have occurred or in which the development of persisting pain is present, but without any obvious underlying pathological process that would cause chronic pain.

One of the quandaries of pain management is the recognition that the severity of the injury doesn't necessarily predict how much pain there will be, nor does the amount of pain present indicate how serious the injury may have been.

THE EPIDEMIOLOGY OF PAIN

Pain is a part of everyone's experience. Ongoing and recurrent pain is surprisingly common. One out of every two patients consulting a physician complains of pain. Most are acute pains associated with limited illness and injury, but a substantial number of the population suffer from chronic pain and these are the most challenging for physicians and the most distressing to patients. According to Crook (1984) and her co-workers, 11 percent of the population suffers from chronic pain. In another population study, 13.9 percent of people had backache 30 or more days during the year. 13.13% had headaches, 13.8% joint pain, and 9 percent muscle pain for 30 days or more during the year. In that study (Nuprin Pain Report), 55% described themselves as experiencing back pain that significantly interfered with function for one or more days per year. It is interesting to note, however, that fewer than 20 percent who reported back pain sought professional help, suggesting that occasional pain is accepted by people as a normal part of life (Chaplin, 1991) and this was indicated in a Swedish study that showed 55% of the population had pain for over 3 months and 49% for more than 6 months (Andersson, 1993). Ninety percent localized their pain to the musculoskeletal system. Women experienced more multiple localizations of pain and had pain in the neck, shoulder, arm and thigh to a greater extent that men. The neck-shoulder area was the most common site of pain (30.2%) followed by the lower back (23.2%). In 13% of the population, manifest pain problems were associated with reduced functional capacity.

Kamwendo et al (1991) surveyed 420 medical secretaries for the prevalence of neck and shoulder complaints and possible risk factors. Neck complaints were reported to have occurred sometime in the previous year in 63%, 32% experienced pain occasionally and 15% had suffered nearly constant neck pain. With respect to shoulder complaints during the previous year, 62% reported shoulder pain sometimes, 29% occasionally, and 17% reported experiencing constant pain. Examination of various risk factors showed that age and length of employment were significantly associated with to neck and shoulder pain. In addition, working with office equipment for 5 hours or more was significantly associated with increased risk for neck pain, shoulder pain and headache. As well, working in a negative psychosocial work environment was also significantly associated with headache, neck, shoulder, and low back pain. The results of this study suggest that ergonomic and psychosocial factors of the workplace put one at risk for musculoskeletal complaints.

Kamwendo et al (1991) in a continuation of a similar study, took a more detailed look at the ergonomic work factors and symptom report of 79 medical secretaries. Their findings on the symptom profile showed low daily ratings of fatigue and pain, low medication use and few stress symptoms. Low correlations were found between symptoms and ergonomic measures. For example the correlation between fatigue, pain and well being with number of shifts from sitting to standing, and time spent typing were small overall. Kamwendo et al (1991) concluded that the risk factors for shoulder and neck musculoskeletal complaint were "individual and multifactorial." The study suggests that although monotonous work appears to be associated with muscular discomfort in some, for most in the study other factors were probably of greater significance, e.g. stress, but further study is required.

It has been estimated that 60 billion dollars are spent annually in the USA on chronic pain, and 550 million sick days are lost annually because of chronic pain mong the working population. Although 74 percent of workers who experience an acute injury which resulted in low back pain are back to work in 30 days, an additional 19 or a total of 93 percent are back to work within 6 months. The residual 7 percent are absent for more than 6 months and although the figure may sound small, many of these never return to work and they accounted for 70 percent of the total work days lost due to back injury, 73 percent of the medical care given and 76 percent of the compensation payments made to all people with low back injuries.

CHRONIC PAIN

The definition of pain by the International Association of Pain Studies is: "Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of tissue damage." This definition indicates that pain is a personal and subjective experience, a multidimensional experience, and can be separable from actual tissue damage. Chronic pain is a collection of symptoms, including pain, reduced function, emotional and behavioral changes.

Everyone * learns the meaning of pain through personal experience and injury. It is a subjective experience, and can be modified in its perception by many personal and external factors. Physicians and philosophers have thought about pain for thousands of years. Aristotle felt it was an emotion, the opposite of pleasantness. Descartes defined the separation of mind and body, and pain was a sign of dysfunction in the body mechanism.

Melzack and Casey (1968) proposed three dimensions to the pain experience. The sensory discriminative dimension identifies pain stimuli and its location, quality, intensity and duration. The cognitive-evaluative dimension appraises the meaning of what is happening and what may take place as signalled by the pain. The affective-motivational dimension relate to the moods and sense of meaning and the need to avoid harm or the expectation of harm. Physicians have tended to concentrate on the first of these, and most physicians dealing with pain patients think in terms of the sensory-discriminative dimension, because that is how we were taught to take the history of pain.

Berna and Chapman (1984) have divided chronic pain development into three stages: 1) the acute injury, 2) the transition period and 3) the learned phase. In the acute injury stage the results and symptoms are related to the injury. In the transition period recovery usually occurs and the person returns to normal activity and function. In the learned phase, through conditioning, further impairments and disabilities may result from the misuse of analgesics, physical inactivity, deconditioning and the prolonged and repetitive function in the sick role. The time required to pass from one stage to another is extremely variable. The acute stage may last hours to days, the transition period days to weeks or even months, and the learned phase often begins after weeks or months, but can be seen as early as 2-6 weeks in some patients. This approach relates only to chronic pain resulting from an injury or event and is not applicable to the large group who do not have a precipitating event.

* There are certain rare congenital syndromes and some acquired syndromes characterized by the absence of pain sensitivity.

Socioeconomic Impact of Chronic Pain

Latham and Davis (1994) in a extensive review article examined several of the social, psychological and economic aspects of chronic pain. The National Institutes of Health estimate that chronic pain afflicts 65 million Americans annually, with other estimates ranging from 40 million to 70 million. Twenty three million Americans suffer from back pain and 24 million from headaches, costing in the order of $57 billion annually in lost production, pain medications, and medical care. The taxpayer costs in terms of social support for pain patients to be between $15,000 and $24,000 per person annually. In British Columbia, in 1981, over $44.3 million was paid out on 20,126 back pain claims, resulting in a total of 658,646 work days lost. Rigge (1990, in Latham and Davis, 1994) undertook a population survey of 1037 people in Britain.They found that 11% of those surveyed suffered from chronic pain and that 70% of these people were taking analgesics. Extended to the general population, 5 million people suffer from chronic pain in Great Britain, accounting for 45 million lost working days, and costing the NHS approximately 193 million pounds sterling per year. Over 50% of people suffering chronic pain said it interfered with their ability to work or live a normal life, with 25% having to miss time at work or be forced to retire. Occupational disability seems endemic among chronic low back pain suffers. Frollick et al (1985, in Latham & Davis, 1994) found that in a study of 107 patients admitted to a chronic pain treatment program, 85% were unemployed.

Return to work estimates vary considerably, with one study reporting the probability of returning to work after an absence of 6 months is 50%, after 1 year is 20% and after 2 years is 10% (McGill, 1968, in Latham & Davis, 1994). However the Workers Compensation Board of British Columbia gives a more pessimistic assessment stating that the probability of returning to work after an absence of 1 year is only 3.6% (Marchiolo et al, 1987; in Latham & Davis, 1994).

The Chronic Pain Patient

Because the physicians have seen pain as a definable symptom of a definable disorder, according to a model that seeks a cause-effect solution to a symptom, they have been slow to recognize chronic pain as a separate definable problem and the chronic pain patient and chronic pain behaviors as clinical entities.

> "The traditional medical view of pain is simply inadequate and inappropriate for the successful management of chronic pain syndrome. Indeed, patients with chronic pain syndrome continue to have traditional medical management, their pain symptoms often increase - along with feelings of anxiety, helplessness, social isolation and depression."
>
> Clifford, 1993

Delayed recovery and the development of chronic pain may be due to "reinforcers" provided by the accident (Derebery and Tullis, 1983). Such reinforcers can include factors such as finances, sympathy, attention from the family and community, escape from responsibility, revenge against the company, and resolution of an internal conflict. The authors point out that this type of patient is frequently thought to be malingering by physicians, although in actuality the secondary factors, when present, are usually unconscious.

It is important to recognize that as the chronic pain develops, pain is no longer a simple index symptom, but acquires a complex symbolic structure. This transformation interferes with the usual patient-physician relationship (Priel, 1991). Symbolism and the meaning of pain must be approached with a psychotherapeutic concept in order to understand and fully address chronic pain as a symbolic communication. When a person begins to see themselves as "ill", an "invalid" or a "pain person" they have taken a major step in the development and persistence of chronic pain. Treatments that do not attempt to reverse this negative self image are unlikely to be successful. (Large, 1990).

Blumer and Heilbronn (1982) feel that chronic pain is a variant of a depressive state. In relating chronic pain and depression they also note that other features are commonly present such as sleep disturbance, change in appetite, decreased libido, irritability, withdrawal of interest, weakening of relationships, somatic preoccupation, and other signs of depression.These authors state that typically, chronic pain patients present as "solid citizens" who tend to idealize their life and relationships. They often talk about themselves as being independent and not requiring help and see themselves as strong and "never giving up". The ideals they put forward are independence, activity and caring for others, whereas in practice they appear to be dependent, passive and in need of care.

Engelberg put forward the concept that a chronic pain disorder can be considered when two or more "D"s are seen (duration, disability, dramatization, drugs, dispair, disuse, dysfunction) (AMA Guides to the Evaluation of Permanent Impairments, Engleberg, 1988) (AMA, 1993). In other editions of the AMA guides a slightly different requirement is given (4 out of 8 "D"s). This is much like the concept of chronic pain syndrome, but is less clear cut in its definition, and has the same limitations outlined by the IASP (1994).

Is There a Pain Proneness?

There is an oft repeated inference in the literature on chronic pain suggesting that there is a pain proneness, because there are many common psychological and social features in these people. The concept was outlined by Engel (1959) and further by Blumer and Heilbronn (1982). There was a broader literature that infers a predisposing psychosocial basis for the development of pain. Chaplin (1991) says, "some of us are coming to recognize that chronic pain is not something that appears by accident, but is the result of an event in a system (the human being) predisposed to suffering."

Blumer and Heilbronn (1982) have defined the characteristics of the pain prone patient.They reviewed 900 patients with chronic pain of obscure origin and found many similar characteristics. Many of the patients had a history of illness behavior. They describe their pain in dramatic descriptive terms but without evidence of great discomfort, and seemed to enjoy the telling of the story of difficulties, problems and pain. They were excessively preoccupied with the pain problem and had often undergone many procedures from many different physicians and therapists. They showed features of depression, anxiety and neuroticism, and showed no realistic planning for the future. Many had a spouse who was a source of stress and half had a history of a relative who was disabled by some injury or disease. There was increased incidence of alcoholism and clinical depression in these patients and in their relatives.

Mary Lynch (1992) of Halifax, in an extensive review of the psychological aspects of reflex sympathetic dystrophy found that in 29 reports, suggesting some psychological basis for sympathetic related pain syndromes, the evidence was weak. In a major review of the literature from the late 1800's to the present, she noted there was "no worthwhile evidence to substantiate the claim that psychological factors or certain personality traits predisposed one to develop reflex sympathetic dystrophy". It is likely that the same conclusion would be drawn about a similar assessment of other chronic pain conditions such as fibromyalgia and chronic low back syndrome. This does not mean that there are not psychological and social factors that might predispose one to develop chronic pain, but the definition of a constellation of features that might constitute a personality type is probably over-simplification, and may confuse symptoms and signs that result from chronic pain rather than predispose to it.

The features of pain proneness and other psychological features of chronic pain patients are too vague and are too general in the population to act as predisposing predictors for chronic pain syndrome.

The Lifestyle of Chronic Pain Patients

A person with chronic pain changes in many ways, particularly if their lifestyle security and employment has altered. Perhaps the most profound is the change in the person's sense of themself as a whole person, as an independent and self sufficient individual, as a provider for the family and as a positive member of the family, workplace and community. It also alters their perception and interest in things generally, and causes their life to become centred on their pain. It also may cause them to adopt the sick role and to demonstrate illness behavior.

Gildenberg and DeVaul (1985) divide patients who take on the sick role into 4 lifestyle categories:

The Overwhelmed Patient: These patients develop a chronic pain response to overwhelming problems. They often have a past history of responding to major stress by escape or withdrawal. Injury and illness allows them escape their stresses and responsibilities and they are rewarded by time off and disability payments. These rewards reinforce the illness behavior. These authors say that 70% of patients in a chronic pain clinic fall into this category.

The Need-to-Suffer Patient: These patients have a long history of unsuccessful and disappointing experiences, and they relate stories of suffering in anguishing terms and dwell in the past.The authors estimate that these patients make up 20 percent of a chronic pain clinic population.

The Assigned Patients: These patients become chronic pain patients because they believe it is expected of them. Five percent of the clinic patients fall into this group. From their perspective, they are following what the physician has prescribed for them. (Physicians don't often recognize that they can create illness situations and illness behavior.)

The Psychogenic Patient: In this pattern pain was a symptom of an underlying psychiatric disorder (of depression, anxiety, hysterical or conversion reaction, unresolved grief, or as a delusional symptom of psychosis). Again 5 percent of their clinic population had this pattern.

On a variety of measures it is shown that chronic pain has a strong negative impact on functional capacity. Rigge (1990 in Latham & Davis, 1994) reported on a survey of 1037 people in which 11% suffered chronic pain. Among these chronic pain suffers, 37% had restricted mobility, 16% had difficulty bending of lifting, and 6% had difficulty getting out of the house. In a study of 10,000 disabled adults, 36% reported that their activities of daily living were impaired by chronic pain (Astin et al 1993, in Latham & Davis, 1994).

Follick et al (1984) and Saunders et al (1983) (both in Latham and Davis, 1994) found a positive correlation with the amount of time spent lying down and the amount of physical impairment. There was a negative correlation with the time spent standing and walking and impairment.

Pain and Memory

Linton (1982) investigated patients memory for their chronic pain. He surveyed 12 chronic pain (pain for more than 6 months) patients about their pain at the beginning at the end of a treatment program. Treatment ranged from 3 to 11 weeks. Patients assessment of their pain upon entering the program was compared with their memory of that pain upon discharge. Linton (1982) found that a patient's recall of their pain level was significantly greater than their rating of that pain at baseline. Linton cautions against using post-hoc pain measures in chronic pain patients.

Bryant's findings (1993) were consistent with those of Linton and Meling (1982). Moreover, Bryant found that patients recall of pain tended to vary with present levels of pain and mood. Bryant offers a plausible explanation for this apparent distortion of initial pain upon recall. In contrast to acute pain, wherein patients have a clear course of onset and subsidence of pain, and distinct time markers for the events, no such temporal guide post are available to the chronic pain patient. Bryant suggests that the variation of recall report with mood and present level of pain may provide an explanation. Chronic pain patients whose condition has worsened may be using their present state as a temporal guidepost, and "may generalize their altered current state to the previous period".

Pain Threshold in Chronic Pain

Although Merskey (1990) suggested that there was a subgroup of depressed patients with a low threshold and tolerance for acute pain, most experimental evidence suggests that patients with depression and patients with chronic pain have higher beta-endorphin levels and seem to be relatively insensitive to acute experimental pain compared to non-depressed volunteers and non-pain controls (Ward 1990). As a group, patients with unexplained chronic pain, and those with psychiatric problems, tend to be relatively insensitive to acute experimental pain.

This creates a paradox. It seems that patients with depression and with chronic pain are relatively insensitive to pain, but have more pain complaints. Ward (1990) suggests that this paradox can be resolved by assuming that the mechanisms of chronic pain are different than that of acute pain. It is an error to assess chronic pain by using acute pain experiments because other neural pathways and neurochemical mechanisms are involved in chronic pain.

The biogenic amines appear to be involved in chronic pain, and those that are anticipated as having a major role are serotonin, norepinephrine, and dopamine. Because serotonergic antidepressants are helpful in chronic pain, it would seem to support the role of serotonin, but the action of these drugs is very complex. Interestingly, Ward (1990) demonstrated that fenfluramine, a pure releaser of serotonin, acutely diminishes chronic back pain, but had no affect on acute experimental pain.

THE PSYCHOLOGY OF PAIN

Psychological testing has to be specifically designed for the chronic pain patient. The MMPI, Beck's Depression Inventory, WAIS-R, have little predictive value and are not routinely used. Chronic pain patients show an elevation of the MMPI triad of hypochondriasis, depression and hysteria, but this doesn't differentiate those who will succeed in rehabilitative therapy for chronic pain and those who will not. Batteries of psychological testing early in the process emphasizes to the patient that we think this is a psychological problem, and sometimes makes them defensive and angry, so must be introduced sensitively and in a way that indicates pain has physical, psychological and social aspects.

It is not surprising that pain can cause emotional changes and even depression, especially if it is prolonged and chronic, and depression may increase the predisposition to chronic pain. Once these relationships are present, they may become cyclical, with one aggravating the other.

Ward (1990) also discusses the implications of loss and grief associated with chronic pain, and the effect of reduced pleasurable events in the lives of chronic pain patients, aggravating depressive feelings. He also mentions the phenomenon of "learned helplessness" in which animals and humans exposed to sustained, uncontrollable noxious stimuli, appear to give up, and no longer attempt to cope with the situation.

Skevington (1983) found patients with chronic pain experience universal helplessness in which they don't blame themselves because they can't control events, and they feel that no one can really help them. These studies suggest that efforts should be concentrated on giving patients a sense of mastery over their pain, reduction in their depression, and a sense of personal control in the management of their pain.

Interpersonal theories have suggested that negative personal relationships often are instrumental in the problem of chronic pain. Some studies have suggested that patients with low back pain are more likely to go on to a chronic pain situation if they are dissatisfied with themselves or their lives, or have marital difficulties or conflicts and dissatisfaction at work. Nachemson (1994) stated that after years of studying ergonomics in chronic low back pain, he concluded that the only important underlying factor in these patients was job dissatisfaction.

Blumer and Heilbronn (1982) said that chronic pain is a "specific variant of mood disorder with characteristic clinical and psychological traits".They would argue that in chronic pain patients there is a masked depression. In support of this, there is no peripheral pain generator that can be found to explain the chronic pain; depression and pain frequently co-exist; vegetative symptoms of depression are often present, even when the patients deny depression and mood disorder; antidepressants are helpful in treating both the chronic pain and the depression; both disorders have high CSF endorphin levels.

As Ward (1990) has suggested, these authors may have described a particular subgroup of patients with chronic pain. Perhaps it would be a mistake to assume that all chronic pain patients fit this model, as other studies have not found marked depression in these patients, although mild depressive symptoms are common, perhaps as a result of having chronic pain.

Patients with some psychiatric diagnoses appear to complain often about chronic pain, and conversely, patients with chronic pain show significant degrees of anxiety disorder and depression (Kuch et al, 1993), but Merskey (1994) suggests the association of depression in patients in a pain clinic is only in the order of 10-30% compared to a population incidence of 8%.

Pain as Behaviour: Operant Conditioning

Over the last 25 years Dr. Wilbert E Fordyce has developed the concept of chronic pain as a behaviour, and as a means of responding to cues and external rewards. Before pain was understood as a behaviour, it was thought of as a symptom, and a result of pain or injury. He has shown how social feedback is often instrumental in developing and continuing pain behaviour. He separates pain from pain behaviour, and shows that there may be a major difference between the amount of pain and the amount of pain behaviour.

Fordyce (1988) also separates classical respondent conditioning as a response, from operant conditioning. In classical respondent conditioning, like Pavlov's dog, a stimulus produces an initial reflex response and then a conditioned response when one learns and can anticipate the stimulus will produce a certain result. In Pavlovian conditioning a stimulus produces a conditioned response. Operant conditioning is different. A pain behaviour elicits a response from others.

Both forms of conditioning are behaviours and both are pain behaviour, but they differ in the circumstances that cause them to occur. Fordyce also points out that they differ in durability. In respondent conditioning the behaviour is unlikely to persist if the stimulus is not repetitive or persisting. In contrast, operant conditioned behaviours need only occasional reinforcement to persist, and perhaps only the occasional anticipation of the situation is enough to make it persist, even though in reality the circumstances never occur - the behaviour is produced because of the anticipation of the circumstance.

As Fordyce explains, "*the pain behaviours are responding to that antecedent stimulus - hence, they are* 'respondent'. Operant pain refers to situations in which the pain behaviours occur as responses to cues in the environment". These cues may be circumstances or situations that have been associated with pain. The person grimaces and winces when the physician is about to examine the damaged elbow or knee. The abused child withdraws and cringes when the offending parent enters the room.The person develops emotional and physical symptoms when passing a hospital where a painful experience occurred, or when coming face to face with someone who has caused us pain.

It is important to understand operant conditioned pain behaviour in attempting to understand pain that persists beyond that expected by the injury or the tissue damage, and persists well beyond the healing period. In differentiating respondent and operant pain it is also important to recognize that they are not always separate, and in most chronic pain patients there is a mixture of the two.

Cognitive Processing

How a person responds to pain has a great deal to do with their previous experiences, the emotional significance of the circumstances and their understanding of the potential damage from the stimulus. For instance, moving heavy furniture with strained muscles, bruised elbows and abraded fingers may be accepted and perceived quietly and without emotion, as a benign part of getting the work done. On the other hand a person may display a lot of cringing withdrawal pain behaviour in anticipation of a hypodermic injection, and marked and noisy reaction to the injection, which is measurably less painful as a stimulus than the abraded knuckles. Bumping your forehead while cleaning the basement, bumping your forehead while rescuing your child at the beach, or getting slapped in the forehead during an argument has dramatically different responses and effects.

Anderson and Pennebaker (in Fordyce, 1988) indicated that the anticipation of pain can be so strong as to produce pain behaviour in the person and a perception by them that the pain actually occurred when it has not. Thus the pain behaviour becomes mislabeled by the person as pain.

Pain perception and behaviour is also affected by a set of expectations about the possible consequences. Thus, if someone is informed that something is likely to be painful, it is probable that it will be perceived in terms of pain. If they are told that something might be pleasurable, the same stimulus may then be perceived as pleasurable. Such a study was done by Anderson and Pennebaker (in Fordyce, 1988) in which people held their finger on a vibrating piece of sandpaper for one second. One group was told that it involved a painful stimulus, the second group was told it was a pleasurable stimulus, and the third group were given no explanation. When they were asked to rate the experience on a scale that ranged from pain to pleasure, the group that were told it would be a painful experience rated it towards the pain end of the scale, the pleasure group rated it towards the pleasurable end of the scale, and the uninstructed group rated it in the middle. Interestingly, when interviewed later, the pain group indicated that the experience could not be perceived as being pleasurable, and the pleasurable group indicated that it could not be perceived as painful. Thus the instructions had produced a set of expectations about what the consequences would be and they were powerful in determining how the stimulus was felt.

Keefe and Follick (1985, in Latham & Davis, 1994) found strong correlates between low back pain and clinically significant psychological disturbance. The most consistent correlates on the MMPI were the subscales dealing with psychosocial impairment and emotional distress. Negative life events can contribute to emotional distress. High levels of negative life events are associated with the psychological symptoms of low back pain patients. Negative events tend to engender discouragement, depressed mood, dissatisfaction, anger and social maladjustment. The emotional distress common among back pain patients can easily be understood in light of these associations (Smith et al, 1985 in Latham & Davis, 1994).

Chronic pain affects every aspect of a persons occupational, recreational, and family life. However there is evidence that some families and spouses can influence the pain condition in negative ways. For example, they may witingly or unwittingly foster the chronic state. Chronic pain patients may have many psycho-social problems, but have difficulty expressing them.Thus, some theorize that chronic pain patients "act out" these problems physically, via somatization, as opposed to communicating them verbally. If the pain or sick role has advantages over the active healthy role, then the pain behaviour may be nurtured and sustained at the expense of the healthy role. For example, since illness can give one an identity, one member of a relationship may use the sick role to maintain their identity and become a mechanism of resolving or avoiding conflicts in the relationship (Latham & Davis, 1994).

Fishbain et al (1986) examined 283 consecutive chronic pain patients for DSM-III diagnosis. Male versus female comparisons for the prevalence of each diagnosis were made. Males were significantly overrepresented in the Axis I diagnoses of intermittent explosive disorders, adjustment disorders with work inhibition, and alcohol abuse and drug dependency. Whereas females were significantly overrepresented in depressive disorders (various types) and somatization disorders. With respect to Axis II disorders, 58.4% of the sample met criteria for Axis II personality disorders. The most common personality disorders detected in the patient sample were dependent (17.4%), passive aggressive (14.9%), and histrionic (11.7%). There was a significant overrepresentation among males for paranoid and narcissistic disorders while females were significantly overrepresented in histrionic disorder. All personality types were equally distributed between the sexes. The most recurrent personality types found were compulsive (24.5%), and dependent (10.6%).

Linton and Gotestam (1985), investigated the relationship between pain, anxiety, mood and muscle tension, and down time in chronic pain patients. Linton assessed 16 (7 female) chronic pain patients attending a pain center to see if there was a relationship between psychological state and chronic pain. He found that emotional and overt behaviours are both related to incidence of pain. However, they are quick to point out the high degree of variability among his sample, which suggests "that there is no 'general' chronic pain patient" (Linton & Gotestam, 1985). The clearest relationship was between pain and mood. They state that their data support the idea of that pain and depression are related. With respect to pain and down time, a significant, but small correlation was found. Muscle tension was found to correlate to self report of pain in a minority of patients (33%). They highlight the fact that muscle tension was a subjective measure (self report), not a physiological measure.

The understanding and interest in pain changed dramatically when Dr. Ronald Melzack of Montreal and Dr. Patrick Wall of England proposed the gate control theory of pain. This provided an understanding of many of the puzzling aspects of pain from a clinical and physiological point of view. Although it continues to be modified, it has been a very important paradigm for the further study of pain physiologically and clinically. The gate control theory provides a mechanism for understanding why in some circumstances pain may be perceived by the individual as greater or less than that expected. There is also evidence that the receptive fields of afferent neurons in the dorsal horn can change and extend so that cells that respond to stimulation from one area may begin to respond to stimuli from other areas, perhaps explaining why regional spreading occurs in fibromyalgia and other instances of regional pain. Merskey (1988) succinctly summarizes these mechanisms in his argument that fibromyalgia is understandable on psychophysiological and physical terms, and is seldom hysterical. There is evidence that slow spinal cord changes will effect the motor output and the sensory information conveyed to the brain. The presence of chronic pain, for instance, will increase the threshold to pain. It has been observed in fibromyalgia patients that they may be relatively hyposensitive to other pain stimuli, especially acute pain experiments.

Pain and Illness Behavior

Patients with pain and illness often develop attitudes and behaviors that have been called illness behavior. Pilowsky (1969; 1971; 1990) defines abnormal illness behaviour (AIB) as:

> "The persistence of an inappropriate or maladaptive mode of experiencing, perceiving, evaluating and acting in relation to one's own health status, despite the fact that a doctor (or other appropriate social agent) has offered an accurate and lucid explanation of the nature of the person's health status and the appropriate course of management including the use of special investigations where indicated, and taking into account the individual's age, educational and social/cultural background."

Abnormal illness behaviour may be consciously or unconsciously motivated, with reality testing intact or impaired, and where the illness is inappropriately affirmed or denied, and the focus of the maladaptive attitude is psychological or somatic. For our purposes, we are primarily interested in abnormal illness behaviour in the presence of chronic pain.

A discussion of chronic illness behaviour includes the concepts of the "sick role" and "illness behaviour". Various societal circumstances and forces grant the person the sick role. Pilowsky (1990) points out that the situation often results in pressures and conflicts because the patient is displaying pain behaviours and a sick role granted by their situation, but the physician has a different judgement as to what is appropriate under the circumstances. Illness behaviour is expressed by symptoms and also actions, directed towards the avoidance of illness. A slightly modified definition of illness behaviour is, "the ways in which individuals experience, perceive, evaluate and respond to their own health status." This definition recognizes the possibility that a person may have concerns about their health and illness in the absence of specific symptoms.

> "Patients with true abnormal illness behaviour have extreme difficulty in accepting the advice of any physician if it does not agree with their own appraisal of their health status."
>
> Pilowsky, 1990

Pilowsky found that in a population of 100 psychiatric patients with hypochondriasis, 76 reported pain and aches. Hypochondriasis involved 3 dimensions - bodily preoccupation, disease phobia, and disease conviction with resistance to reassurance. Pilosky has published an illness behaviour assessment schedule (IBAS) (Pilowsky, 1983) to assess this aspect of chronic pain.

Pain behaviour continues only if there are consequences that reinforce it. The cues that cause the person to anticipate certain consequences, and to display pain behaviour may be internal or external. If a pain behaviour creates a response that is positive and rewarding, the pain behaviour will tend to persist and recur. A person with pain may unconsciously note that certain expressions, facial grimaces, movements, moans or words elicit a positive and caring response from a person around them. Such appearances and behaviours may also elicit other "rewards" such as pain medication, attention, attempts to bring comfort and other efforts to make the person more comfortable. It may elicit sympathy, suggestions to rest, to stop whatever work or effort they are making. The person will often object to a suggestion that they are displaying pain behaviour to elicit a response - after all, they are experiencing pain. Individuals do not usually separate pain from pain behaviour. Also, people differ in their pain behaviours. Some are stoic and uncomplaining, reinforcing their sense of personal strength and mastery over the slings and arrows of daily life, and often receive admiring regard from others for their bravery. The next person may give loud and emotional complaints of their pain, and may elicit a lot of care, attention and sympathy.

Fordyce also makes the point that these behaviours become conditioned because of the anticipated response, but if the response is there anyway, conditioning is less likely to occur. If one is aiming to reduce pain and pain behaviour, it is important to note which reinforcing responses are contingent on pain behaviour and to modify these. For instance, instead of administering analgesic medications when a patient frequently complains, it could be accepted that they have pain and therefore are prescribed pain medication on a regular sheduled basis, removing the need for complaints and pain behaviour to receive medication.

Pain behavior in low back pain was extensively reviewed by Waddell (1980). He developed a "Waddell Score" that assessed the tendency of people with low back pain to exaggerate the extent of their dysfunction beyond that which could be reasonably expected for the amount of organic disease present. A more recent study by Hirsch et al (1991) investigated the relationship between biomechanical variables measured during lumbar dynamometry, and several psychological tests including the measures of non-organic pain behavior by the Waddell Score. The authors found that those who scored poorly on the Waddell Score suggesting excessive pain behavior also scored worse on all other tests, and they suggest that poor performance on biomechanical testing in this population may be a form of abnormal illness behavior and thus may not accurately reflect organic alterations of neuromuscular function. These patients also had similar low scores on the Coopersmith Self Esteem Score.

The study by Waddell (1980, 1988) and the British Columbia study (Hirsch, 1991) emphasized that the only treatments that have shown any consistent evidence of success in chronic low back pain are behaviorally oriented.

Avoidance Learning

Behaviour that avoids or postpones an anticipated aversive consequence is called avoidance learning. If a person feels that bending or lifting produces their back pain, they avoid bending or lifting. They may continue to avoid these things long after the healing has occurred because they anticipate that pain and discomfort may result, and thus just the anticipation is enough to cause the person to avoid the circumstance. A worker may avoid certain procedures or tasks at work because of the anticipation of a recurrence of pain or discomfort that had occurred in the past. Any minor discomfort on making an attempt will confirm that this may precipitate the painful problem, but just the anticipation itself may be enough. Once established, avoidance behaviours may become deeply ingrained and highly resistant to extinction because the action or behaviour to be avoided seldom occurs. Every time the circumstance is avoided it tends to confirm the effectiveness of avoidance behaviour, and appears to have been successful. Avoidance behaviour may not only reduce pain, but it may achieve other advantages such as the avoidance of unpleasant chores and work. Again, the absence or decrease in pain seems to indicate the success of avoiding work which reinforces the avoidance behaviour.

It is worth noting that in the pain behaviours that use avoidance learning, it is only required that the person anticipate that an activity will lead to increased pain, it does not require that the pain actually occur. The person with back pain may slowly roll out of bed, bend forward and pull themselves upstairs by the hand rail, slowly and limp across the room, slip into a chair, hands holding their back, all in the anticipation of pain. Also, the absence of pain confirms that the pain avoidance behaviours were successful and therefore they will be repeated.

Pain Associations

It is possible that a person can associate other unrelated things to pain, and they then become capable of inducing pain behaviour. Fordyce calls this "superstitious learning" because the belief and the behaviour attached to it do not rely on rational inference.

One common pattern is trauma related. Although the trauma that occurs may be expected to produce pain and other symptoms for a limited period of time, it may take on aspects that are emotional and frightening, and pain behaviours then may occur over a very prolonged period because of the associations involved. Pain may be induced by exposure to the circumstances or memories or associations under which the trauma occurred.

A second is conditioned adversive stimuli. The association with a place or circumstance may be so strong that it induces symptoms over a long period. The sight or presence in a hospital where pain and sickness occurred to the individual may accentuate the symptoms again.

Depression in Patients with Chronic Pain

Depression is an common psychiatric diagnosis, occurring in about 5% of the general population. Merskey (1994) recently reviewed the current understanding of depression in patients with pain. He noted, and previous reviews noted the inconsistency of the data available in the literature, and the difficulty of comparing different studies. He concludes that there is probably an increased frequency of depression in pain clinic patients and of pain in patients with depression, but the frequency varies with the sample and with the method used for measuring depression, and suggests that the frequency of sustained depression in pain clinic populations is in the order of 10-30%. The frequency of depression in patients with chronic musculoskeletal pain is 14.4% compared with a population incidence of depression of 8%. However, it is difficult to know whether the pain causes depression or the depression is due to pain in any particular case. Another interesting observation is the suggestion by Magni et al (1987) that there are some patients who have chronic pain, and do not appear to be depressed, but respond to antidepressants and show a reduced number of imipramiprine binding sites and have a family history of depression. Although it is often a frequent symptom in patients with chronic pain, much depression is undetected and under treated. Patients also often present to the physician with symptoms, but do not complain of and often deny depression, when it is clearly present. One way to assess depression in large groups of patients, such as those with chronic pain, is to use self-rating scales. The Beck Depression Inventory and the Zung Self-Rating Depression Scale correctly identified 82-88 percent of depressed patients in a sample of those with chronic pain (Ward, 1990). The MMPI was less accurate in screening. (It is important to recognize that these are screening scales and not diagnostic scales.)

A number of disorders can be confused with depression in chronic pain. More than half of the patients with anxiety really have a major underlying depression. Other patients fit the DSM III-R criteria for somatization disorder. The previous concept was Briquet's syndrome, describing a patient with symptoms beginning before age 30, with many unexplained complaints in many organ systems. Panic disorder is also commonly present with depression and can produce its own variety of somatic complaints.

Hysterical, Hypochondrical and Psychogenic Regional Pain

As pointed out by Merskey (1990, in Bonica) "Systems of medical diagnosis and even systematic taxonomies are not divinely inspired, do not conform to uniform laws, and frequently adopt systems of axes to deal comfortably with available data." He comments that there are a number of different psychological approaches to the problem of chronic pain, and they are not necessarily exclusive or correct. They each show an approach that deals with the information, observations and provides a framework of understanding.

Walters in Toronto in 1961 reported the first large series of psychiatric patients with pain and outlined their clinical features. Of the 430 patients he saw for pain, 185 had pain in the head and neck, 133 in the chest and upper limbs, 112 in the low back and lower limbs, 61 in the trunk and back, 50 in the genitals or pelvis, 7 with pain all over, and other had pain in the abdomen, all four limbs or both limbs and one side.Twenty-six were said to have hysteria, 68 with psychosis, including 45 with depression, and the majority, 336, had other neuroses and situational states. Many of the patients had minor physical lesions that gave rise to greater pain that one would expect. Walters coined the term "psychogenic regional pain" which never found wide acceptance.

In Merskey's study (1965) 75 percent of chronic pain patients had a diagnosis of neurosis, 8 percent had a diagnosis of reactive depression, 12 percent had a diagnosis of endogenous depression, 2 had schizophrenia. In his patients a hypochondriacal personality was most common. In a comparison with other psychiatric patients he found that neuroses, particularly hysteria, were more common in chronic pain patients but that depression, schizophrenia and other disorders were lower.

Merskey has noted that pain is often on the left side in patients who have hysterical features, but the pain can be in almost any area of the body. The population prevalence of such pain is uncertain but estimates of 11-43 percent have been found in psychiatric departments. Merskey says the pain is usually described in simple sensory terms, but some may have very complex descriptions. The pain is usually continuous throughout most waking hours but fluctuates in intensity. It usually doesn't awaken the patient from sleep and usually lasts for more than six months.

Associated features include anesthesia, unexplained paralysis, involvement of many areas with pain, many physician visits, but without belief in the reassurance. Patients often overuse analgesics and other drugs, even though they are not effective. Patients tend to reject psychological explanations. They often have unhappy marriages. Patients often demonstrate "la belle Indifference". Merskey says that they have depressive complaints and resentment, and their personality is often of a dependent, hystrionic, labile type. There are three types. The first is the monosymptomatic type, with pain in one or two areas, and this is relatively infrequent. The second type has more numerous complaints and recognizable hysterical symptoms. These symptoms often number more than 25 and involve many areas and many systems. The third is the hypochondriacal patient with excessive concern or fear of the symptoms and a conviction that serious disease is present despite the reassurance of many physicians and normal investigations. These patients are preoccupied by their illness.

In a study of 1679 patients who were injured at work, 10.4% of them were found to be in the range of simulating back pain symptoms based on patients responses to a 103 pain word scale (Leavitt, 1991). Simulation comes in two forms: 1) conscious exaggeration of existing symptoms or 2) the invention of symptoms that do not exist. Patients scoring in the simulation range of this scale, report pain of extreme intensity and disability of longer duration. Tissue pathology does not support the possibility that higher pain intensity and greater disability are associated with greater organic pathology, as less tissue pathology was found among simulators. Furthermore, physician judgement of symptom exaggeration correlated with high simulation scores among patients who were classified as simulators. Thus high simulation scores, are associated with exceptionally high pain intensities and disability durations that are not consistent with the medical evaluation.

Patient Selection

It was important to recognize that different patient groups may have different characteristics based on the selection or self-selective factors (Merskey in Wall, 1994). For instance, some patients with chronic pain may not seek medical attention. Others may visit only their family physician. Others may be seen by a large number of physicians, psychiatrists and neurologists. Others may attend pain clinics. The features and characteristics of each group may be different. For instance it has been found that the characteristics of chronic pain patients in a pain clinic were different than those seen by private psychiatrists. It is expected that there would be differences between chronic pain patients who are seeking compensation from those who are not, and those who are seeking redress in the courts compared to those who are not.

Dr. Vladimir Hachinski of the University of Western Ontario, in commenting on the hysterical versus neurophysiological debate by Weintraub and Mersky, noted that selection factors may be important in determining what kinds of patients get to what kind of physician. "Given the high prevalence of chronic pain syndromes, subjects become increasingly selected depending on whether they seek medical attention, whether they are referred, and, if referred, whether they are satisfied. By the time they reach the office of a world expert, they may display features consistent with the expert's practice, but they are hardly representative of the problem at large".

Another aspect of patient selection is the tendency for some patients to seek a great deal of attention and medical consultation.Those who are most anxious and depressed will seek the most attention. Patients in a pain clinic may demonstrate features different than those in a family practice unit. For instance, patients in a pain clinic show more evidence of psychological and social problems. They had more difficulties in activities of daily living, more generalized somatic symptoms such as loss of appetite, reduced energy and diminished libido, depressive feelings, social withdrawal and alcohol and drug abuse. There are also major differences in their recovery rate. Two fifths of those in the family practice group recovered while only one fifth in the pain clinic improved. Again, this may have something to do with patient selection, as the more severe, chronic and anxious patients might gravitate towards pain clinics. There are also some selection characteristics associated with the group of patients with chronic pain who seek compensation. As a result, in this review we tried to be aware of the element of selection bias in the studies we surveyed.

Another indication of the effects of studying different populations was seen in a Danish study (Prescott, 1993). Patients in rheumatology clinics are often described as having fibromyalgia characterized by sleep disturbance, depression, irritable bowels and morning stiffness. When fibromyalgia was studied in patients selected from a national health interview survey in Denmark, they found many of the expected associated features of fibromyalgia including subjective swelling, fatigue, headache, difficulty in stair climbing and poor self evaluated health, with more tender points. Contrary to what was expected, fibromyalgia patients did not suffer from sleep disturbances, irritable bowel or morning stiffness, perhaps suggesting that patients in the community are different than the selected fibromyalgia patients that turn up in rheumatology settings.

Chronic Pain Problems Tackled in Pain Clinics

- Unrelieved headaches (that won't respond to conventional management);
- Failed back syndrome (back pain that persists despite multiple operations);
- neck pain that resists usual treatment (including whiplash injuries);
- pain due to injury of compression of peripheral nerves (nerve damage or entrapment);
- neurogenic pain (due to compressed nerves);
- pain from central nervous system injuries - eg, thalamic syndrome;
- severe arthritic pain (which doesn't respond to conventional treatment);
- facial pain of various types ("spontaneous" and post-surgical);
- persistent muscular pain;

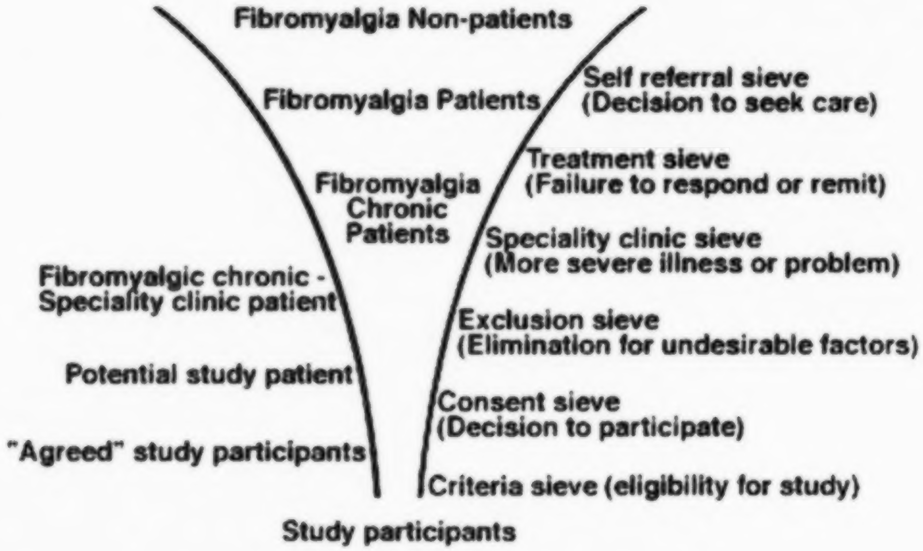
- reflex symathetic dystrophy (where a simple but very disabling trauma leads to extreme burning pain
- often in an arm or leg);
- "phantom limb" and stump pain;
- cancer pain;
- post-herpetic or post-shingles pain;
- persistent pain of unexplained origin.

Source: Health News. (1989) Faculty of Medicine, University of Toronto. 7(5):1-6.

Crook et al (1986) at McMaster University studied two groups of patients with pain complaints. One group was selected from a typical family medical group practice and the other was from a specialized multidisciplinary pain clinic. The two groups were similar in most demographic variables, the length of the pain history, and the most commonly reported sites of pain. However, patients from the pain clinic were more likely to have had work-related accident, to report greater health-care utilization and to complain of more constant pain and greater levels of disability. Patients from the pain clinic reported greater impairment on the indices constructed to measure psychologic, social and performance consequences of the pain experience. What most distinguished patients from the pain clinic was not medical factors alone, but reported impairment in function and psychosocial difficulties. The implication is that patients referred to specialized pain clinics may not be representative of individuals in general who suffer persistent pain; the former likely require an interdisciplinary approach that includes attention to psychosocial and disability issues, not just medical or surgical treatments of pain.

The sieve of Wolfe (Wolfe, 1990) shows the many levels of selectivity within the medical system for fibromyalgia patients which he refers to as the "fibromyalgia funnel".

Fibromyalgia Funnel


Fibromyalgia Non-patients
Fibromyalgia Patients
Self referral sieve (Decision to seek care)
Fibromyalgia Chronic Patients
Treatment sieve (Failure to respond or remit)
Speciality clinic sieve (More severe illness or problem)
Fibromyalgic chronic - Speciality clinic patient
Exclusion sieve (Elimination for undesirable factors)
Potential study patient
Consent sieve (Decision to participate)
"Agreed" study participants
Criteria sieve (eligibility for study)
Study participants

Wolfe F (1990). Fibromyalgia. Rheu Dis Clin North America; 16:681-699.

PSYCHOPHYSIOLOGIC PAIN SYNDROMES

The concept of psychophysiologic pain syndromes, often referred to as "stress-induced pain syndromes" are among the most common chronic pain syndromes. Many of these are well known, and the association of stress with physical symptoms and pain are well known to the general public. Such conditions as tension headaches, migraine headaches, myofascial pains, chest pains, cardiac, peptic ulcer pain, functional bowel disorders, pelvic pains and other common pain syndromes are widely known.They may have other inducing factors, and they may be either acute, recurrent or chronic. They can be induced by an injury, or their presence can complicate the assessment of an injury, as the process may be aggravated when the added emotional and physical stress of an injury is superimposed.

Most psychophysiological pain syndromes are mediated by the autonomic nervous system, and we are increasingly aware that the key mechanisms may be within the central nervous system, rather than the focal areas where the pain manifests, such as the muscles, tendons and joints.

To understand the role of stress in the augmentation and alteration of pain responses, I quote the example used by Richard A Sternbach:

"Imagine someone's very stressful world, consisting of constant loud noises in the workplace, deadlines to meet, and harassment by supervisors. Wages are barely adequate in meeting bill payments. At home the spouse is carping and the children are unruly. Commuting to and from work is a nightmare of traffic in a car about to expire because no money is available for maintenance. Such a pattern is characteristic of many workers."

Broadly speaking, Sternback says there are five ways in which a person may respond to such a lifestyle:

a) Adaptive Response: The individual may remain calm - if not cheerful - and optimistic and continue to function well despite adversity.

b) Behaviour Disorder: The person may engage in such behaviours as alcoholism, shoplifting, extramarital affairs, or other forms of acting out as a reaction to the stress.

c) Thought Disorder: The individual may escape the intolerable situation by taking mental, rather than behavioral, flight. Schizophrenic or paranoid or related disordered thinking may incapacitate the person.

d) Affective Disorder: The person may suddenly feel overwhelmed and trapped by the life situation, and experience intolerable anxiety and/or depression.

e) Somatoform Disorder: With or without awareness of accompanying emotional responses, the individual may develop significant physical dysfunction. The person may experience such symptoms as nausea, dizziness, fatigue, pain, or itching, or may manifest such diseases as ulcers, hives, hypertension, colitis or migraine."

In this last pattern, the one that interests us in this review, the patient shows "the mysterious leap from the mind to the body" in which the stress becomes manifested in physical symptoms. The situation is complicated by the lack of recognition by the person in most instances that the symptoms are the result of the stress.

There is often a reason for the patient responding in a certain way. It also may be some physical trauma or defect that causes one patient to respond with physical symptoms in one system or area, and another to respond in another. Thus patients with degenerative arthritis will often respond in an area that has that problem, whereas those who tend to have other physical characteristics or tendencies may develop features in another system. However, responses are common, such as contraction of muscles around the neck and face, the shoulders and upper limbs, over the chest and costo-chondral junctions, the abdomen, pelvic areas and leg muscles.

Patients with the chronic pain often have disruption of family and job, and feel depressed, bitter and angry, with feelings of helplessness and hopelessness. They are often involved in frustrating litigation, and often lose. They harbor feelings of lowered self worth and guilt. They have negative feelings about themselves, the people around them, their situation and their future. They tend to make few plans for the future and become isolated from friends, family and society. They still hope for a cure, but further visits to therapists and attempts at yet another treatment just increases the frustration and anger. Their life becomes centred around and controlled by their pain.

Often times it is easier to understand chronic pain patients if we talked about their suffering as opposed to their pain, as we still tend to be fixed on a model of pain that incorporates mechanisms of peripheral receptors, neurotransmission and neuronal interconnections.

Perhaps the most dramatic psychophysiological syndrome is that of a conversion reaction, in which the psychological conflict produces a dramatic physical syndrome such as paralysis, blindness, numbness or other dramatic symptoms. More commonly, stress is somatized, with an expression of the stress in symptoms such as pain.

SUFFERING

> "The profession of medicine is being pushed and pulled into new areas, both by its technology and by the demands of its patients. Attempting to understand what suffering is and how physicians might truly be devoted to its relief will require that medicine and its critics overcome the dichotomy between mind and body and the associated dichotomies between subjective and objective and between person and object."
>
> Eric J Cassell

Although the title of this paper and project is related to "Pain", I suspect that we would understand the situation and the patients much better if we concentrated more on the concept and meaning of "suffering".This would help us understand what is occurring to the people, their families, their therapists and all the others to relate to them.

The aim of the medical profession is to relieve suffering. Cassell (1982) reminds us, however, that this may be naive. He states that the public, and patients, feel that the aim of the medical profession is the relief of suffering, but apparently the profession doesn't. Doctors tend to separate the physical and the non-physical aspects of suffering. Medicine's traditional concern for the body and physical disease, and the widespread belief in the mind-body dichotomy on medical theory and practice, resolves to the paradoxical situation in which physicians may even create suffering in the course of their treatment of the sick.

A football player, injuring their leg, will often accept it without any apparent suffering, and regards it as an annoyance that may impede or end their play in the game. He often gets up, limps a little and then attempts to "run it out". In other circumstances a person may experience leg pain and have associated anxiety and suffering because it is seen as potentially threatening, and with long term consequences. The person may refuse to move, and after periods of rest, when the leg becomes stiff and sore, it increases the feeling that the tissues have not healed, and causes them to rest more, which in turn may aggravate the symptoms and problems and fulfill the prediction that the injury was serious with long term consequences. The person will often express a lot of pain and suffering behaviour which is reinforced by the continuing symptoms, or just the anticipation of movement and pain.

Cassell makes three major points. First, suffering is experienced by persons. Personhood is multifaceted, and includes mind, spiritual, body and the subjective experience. Second, suffering occurs when an impending distruction of the person is perceived, as from any event that threatens the intactness of the person. The third point, and one that I think is often missed, is that suffering can occur in relation to any aspect of the person, whether it is in social role, group identification, the relation with self, body, family, or the relation with a trans-personal transcendant source of meaning. Suffering is ultimately a very personal matter. Patients may report suffering when one does not expect it, or do not report suffering when one expects they would.

To try and understand the person, Cassell offers some important points about personhood:

- A person has a personality and character
- A person has a past
- A person has a cultural background
- A person has roles
- A person exists with other persons
- A person is a political being
- A person has a body
- A person has a secret life
- A person has a perceived future
- A person has a transcendent dimension, a life of the spirit.

All of these elements of the person are susceptible to damage and loss. What might happen from an injury or illness is not always predictable in the individual. Cassell says that the only way to learn what damage is sufficient to cause suffering, or whether suffering is present, is to ask the sufferer.

As Fordyce (1988) comments, "One of the greatest problems in clinical pain, particularly chronic pain, is the confounding of pain with suffering, both by the patient and by the professional." Thus the appearance of continuing pain behaviour or suffering behaviour is interpreted as ongoing pain. However, if the person continues to anticipate the consequences or uncertainty associated with the pain, the behaviour may continue when the pain is not there.

In overcoming the weight and impact of suffering, people can begin to find meaning in their experience, or achieve transcendence over the experience. In many cultures, suffering is seen as a way of bringing one closer to God. Frankl (1984) found that overcoming adversity and suffering was one way that people found meaning in their life. As Cassell says, "This 'function' of suffering is at once its glorification and its relief. If, through great pain and deprivation, someone is brought closer to a cherished goal, that person may have no sense of having suffered but may instead feel enormous triumph."

"Pain and suffering" are often identified as similar in medical literature but they are phenomenologically distinct. Women undergo extreme pain in childbirth, but regard childbirth as joyous and rewarding. I have a friend who has repeated kidney stones which cause excrutiating pain, but he knows what it is, understands it and endures it like one of those irritating problems of life like a flat tire or a broken window pane. Patients suffer when they perceive that there is some threat to their person, they have no control and that the pain may not pass. When patients feel that their problem can be managed, and that their pain and distress can be controlled, their suffering is remarkably reduced. A loss of control is an important component of suffering. Cassell concludes that people in pain report suffering when they feel it is out of control, when the pain is overwhelming, when its source is unknown, when the meaning of the pain is dire, or when the pain is chronic. Thus, they perceive pain as a threat to their continued existence, not merely to their lives, but to their integrity as persons. There is some hope in this concept, as we may be able to relive suffering if we can make the source of the pain known, or change its meaning, or demonstrate that it can be controlled, or that an end is in sight.

Cassell also says that physicians often do not validate the patient's pain. We must also struggle to try and understand the meaning of the illness and the pain experience for that individual patient. He indicates that suffering, seen as the emotional component of pain, involved anticipation of consequences. If the person believes that the pain is part of a threatening or destructive process, it will be perceived as suffering and the pain and the pain behaviour will be greater. If the person experiences the pain and is frightened by it and unsure of what it means to them or their future, the pain and suffering will be greater.

IMPORTANT SYNDROMES CAUSING CHRONIC PAIN

Chronic Low Back Pain

Low back pain is one of the most common pain syndromes in the general population. By middle life most people will have experienced an episode of low back pain. Studies in Denmark and Sweden have shown that 50-70% of adults report having experienced low back at some time in the past and as many as 25% of adults report experiencing back pain in a given year (Skovron, 1992). In a review of the epidemiology of low back pain, Skovron suggests that 1-2% of workers in the USA, Canada and the UK are off work due to compensable low back pain. He also notes that there is evidence that the problem of work loss due to low back is increasing and in Sweden the annual frequency of sick-listing due to low back pain increased from 1% in 1970 to 8% in 1987 (Nachemson, 1994).

In the USA back pain is the second most common reason for physician visits and accounts for 2.3% of all visits, with an estimated 2.8 physician visits per episode with an overall cost for health care related to low back pain of over one billion dollars per year.

Fortunately, most low back pain is acute and self-limited. In Canada, 75% of compensable back pain resolves within 4 weeks and 90% within 3 months (Skovron, 1992). But in 5%, back pain persists for 6 months or more. The prevalence of chronic low back pain, defined as back pain of more than 6 months duration, varies from 1% in the USA, 0.05% in the UK, 4% in Finland and 4% in Sweden.

Although most are acute and self limited, they may recur. Nachemson found that 60% recurred over a 2-year period, and in Canada Abenhaim and Suissa (1988) found that compensable low back pain recurred in 36% over 3 years. In the Netherlands 83% of subjects with a history of low back pain had more than one episode.

Factors in the Workplace

In a study of patients with low back pain in Ontario, Tarasuk and Eakin (1993) noted that the patients experienced a level of uncertainty and suspicion which shaped their interactions with the health care system, workplace and compensation system. They tended to see themselves as having a permanent physical vulnerability that changed their perception of themselves and their future. It also changed their social relations in the workplace and gave them a sense of job insecurity, which altered their attitudes towards recovery and return to work. This experience of individual workers, however, varied according to other influencing factors such as age, occupation, job status and seniority, job opportunities and financial security. Patients with low back pain also have difficulty receiving acceptance and legitimacy for their problems.

One complicated circular problem for patients with low back pain and chronic pain syndrome relates to negative social relations in the workplace and job dissatisfaction. Negative relationships and job dissatisfaction may be important in the development of chronic pain syndrome (Bergenudd and Nilsson, 1988;

Bigos et al, 1986; Battie et al, 1990; Dehlin and Berg, 1977). However, once the chronic pain syndrome has developed many negative connotations develop in the workplace towards the worker who is off sick, particularly if the other workers have to take up the slack, increasing the worker's stress and aggravating the stituation.

Nachemson in Sweden (1994) noted flyers who had vertebral fractures from emergency ejections (at 10 times body weight pressures) were all back to work in one month despite evident X ray changes, and none were disabled long term due to chronic low back pain. The answer seemed to be that they are highly motivated, love to fly and get a great deal of satisfaction out of their jobs. He said ergometrics has been of little help in understanding what is going on with chronic pain syndrome due to back pain, or in showing differences between those who get chronic back pain and those who do not. Although twisting-lifting movements are most likely to cause an injury, but after years of study of ergometrics, he concluded from all his studies that the real factor was job satisfaction.

Psychological Factors

Many conditions with minor trauma recover rapidly. In cases where the pain continues long after the injury, the mechanism is often assumed to be psychological. It may be more complex than that and involves many inter-related factors. It has also been suspected that many of the patients who have compensation or legal redress have continuing symptoms to obtain financial reward. However, there are a number of studies in the chronic pain of whiplash syndrome and of post-traumatic syndrome that show that they remain ill and with chronic symptoms long after their entitlements have ended (Mendelson, 1982; Merskey, 1984).

Psychological factors have long been noted to be a factor in chronic low back pain, and the patient's perception of disability and fear of activity has also been related to the persistence of low back pain. Low job satisfaction has been related to low back pain (Skovron, 1992; Nachemsen, 1994). In a study of Boeing air craft workers, a higher score on the hysteria subscale of the MMPI was predictive of subsequent disabling back injury, but an even stronger predictor was the employee's job satisfaction. The same investigators found in an earlier study that poor performance rating by supervisors was also associated with work absence from chronic low back pain. Other factors associated with the number of cases of low back pain are divorce, or widowed marital status, low educational attainment, and the availability of compensation wage replacement.

Polatin et al (1993) investigated the current and life time prevalence of psychiatric syndromes in 200 chronic low back pain patients. They indicate that psychiatric disorders are very common among chronic low back pain sufferers. Ninety-eight percent showed at least 1, DSM-III-R, Axis-I disorder, compared to 29% to 38% in the general population. In particular 97% indicated somatoform pain disorder. Polatin et al (1991) report that even after the debated category of somatoform disorder is deleted, lifetime prevalence criteria was met by 77% of the patients and 59% showed current symptoms of at least 1 psychiatric diagnosis.
After somatoform disorder, the most prevalent disorder was depression with a lifetime prevalence of 64% among these patients. Of those meeting the depression criteria, 54% suffered depression before the onset of back pain and 46% after, with 45% currently symptomatic for major depression.Thus chronic low back pain patients seem to be roughly equally divided into 2 camps: those with premorbid and those with postmorbid onset of depression (Polatin et al., 1993). Psychoactive substance disorders (dependence and abuse) were the second most prevalent disorders among the chronic low back pain patients. Life time prevalence for psychoactive substance disorder was 36%, with 94% of the patients having this problem before the onset of chronic low back pain. Thirty-three percent were currently symptomatic. Anxiety disorder, (generalized anxiety disorder, panic disorder, agoraphobia, social & simple phobias, obsessive compulsive disorder, and post-traumatic stress disorder), showed a 19% prevalence and was not noticeably different than other population estimates ranging from 10% to 25%. (Polatin et al., 1993)

Personality disorders (antisocial personality, dependent personality, passive-aggressive, paranoid, avoidant, borderline) were frequent and occurred at 3 times that of general population among chronic low back pain patients, with life-time prevalence at 51%. Polatin concluded that psychoactive substance abuse may be predisposing to chronic low back pain, whereas depression may be either predisposing or consequential to chronic low back pain.

Disability/Compensation Issues

> "The adversarial process of litigation may influence recovery from injury in several important ways. Financial compensation may discourage a return to work, the appeal process may increase disability, and recovering patients may be unable to resume working. Accident and resulting symptoms may represent the patient's solution to life's problems. During litigation, the patient's pain behavior may be reinforced,maximized, and groomed, with the intent of increasing the final settlement. As a result of this reinforcement, the pain behavior develops into a learned response and becomes a disability for which the patient is seeking compensation. Disability, along with pain and suffering, strongly influence the amount of compensation awarded, so a learned behavior becomes a determining factor in the amount of the award."
>
> Walsh and Dumitru (1991)

Walsh and Dumitru (1991) have noted that the influence of financial compensation on recovery from injury is one of the most controversial issues in the treatment of low back pain. Up to 35 percent of sedentary and 47 percent of physical labourers may acquire occupationally related low back pain, but in 90 percent the problem will resolve in 6-12 weeks. Many spontaneously recover, but 70-80 percent suffer a recurrence, and these are apt to be more severe and long lasting. Between 5 and 10 percent have chronic or recurrent back pain which may persist for many years. This low percentage has a disproportionate socioeconomic impact, and constitute the third major cause for activity limitation in persons over the age of 45. Although acute low back pain is much more common, those with chronic low back pain account for three times more work days lost, restricted activity and disability. Nearly 2 percent of the total industrial work force suffers a compensable back injury every year and Bonica (1990) estimated that 18 million Americans currently had low back pain and 8 million were partially disabled, with 2.4 million totally disabled.

Walsh and Dumitru (1991) reviewed the costs and the studies related to compensation and low back pain. They noted evidence that increases in claims for compensation follow increases in the amounts of compensation and that compensation has the effect of prolonging injury duration, adversely affects the outcome of surgery on low back pain, measured by returning people to work, and increases the costs related to initial treatment of low back pain. Krusen and Ford, (1958, in Walsh and Dumitru, 1991) evaluated 509 patients undergoing rehabilitation for low back pain and noted improvement in 56% of those receiving compensation compared to 88% of those not receiving compensation. Compensation patients showed 33% less impairment than not compensated patients, yet received 200% more physical therapy treatments. They indicated that the use of standardized medical protocols would reduce the cost of treating industrial low back pain and hasten the patient's return to gainful employment. They conclude that rehabilitation can succeed despite the financial incentives related to compensation, particularly when considered that many of these patients would never return to work without adequate rehabilitation and training. They also outline a number of the programs and approaches that have been successful, often with acceptable return-to-work rates in the 60-80% range.

Caldwell and Glanville, (in Frank, 1993) reported on 373 patients under the age of 40 who presented with low back pain. These patients were followed for 10 years, and the impact of low back pain on work and incomes was reported. A single attack was seen in only 11%, with multiple attacks being the norm.

Most frequent duration was less than 2 weeks. During the 10 year follow-up only 33% didn't lose time at work due low back pain. Among men, 3.3% gave up work entirely or took early retirement, and 10% took a reduction in the number of hours worked. Nineteen percent of men and 10% of women experienced a loss of income and 21% changed their jobs. The impact on workers and lost income is considerable.

The Quebec Task Force on Spinal Disorders in the Workplace

An important task force on low back pain reported in 1987, and strongly recommended that the attitude towards low back pain be changed (Report of the Quebec Task Force on Spinal Disorders in the Workplace, 1987). It seems to have had little effect on the Quebec Workmens' Compensation Board, and was resisted by organized labour (Spitzer, 1993). They strongly recommended that individuals with uncomplicated low back pain remain at work, or quickly return to work despite pain.

The approach of the task force was important in understanding how they made their recommendations and why many might have trouble with them. The task force confined itself to evidence according to predetermined criteria, and did not give weight to opinions that were not supported by predetermined criteria for scientific evidence. A lot of people, including physicians operate on opinions and feelings that may not have such strict scientific rigor. They used a method called "Best Evidence Synthesis" pioneered by Slavin and adapted to the biomedical field by this task force. Their recommendations were based on the best evidence available, but the major author on the task force later expressed bitter disappointment about how little had been acted upon in this country. He noted that this type of approach also identified areas where research was necessary, but little research is being directed at these identifiable gaps. Although it is expensive, he also noted the expense of not doing the research. Spitzer estimated that as much as 10% of the total Workers' Compensation expenditures in any Canadian province (more than 10 million dollars per year per million inhabitants) is spent on unnecessary sick leave and ineffective treatments for low back pain alone.

Reported Diagnostic Features of Muscle Pain Syndromes

	Fibrositis			Non Restorative sleep syndrome	Fibromyalgia		Myofascial pain syndrome
Feature	Smythe[5]	Kraft et al[9]	Sheon	Moldofsky et al[4]	Wolfe	Yunus et al[3]	Travell & Simons[7]
Widespread aching (3mo)	X	...	X	X	X	X	...
Tender points (no)							
Skin roll tenderess	X	...	...	...	...	...	...
Disturbed sleep	X	...	X	X	X	X	...
Normal x-ray and laboratory findings	X	...	X	X	X	X	...
"Type A" personality	X	...	X	...	...	...	...
Relief with heat	...	...	...	X	...	...	...
Dematographia	...	X	...	X	...	...	...
Emotional distress	...	...	...	X	...	X	...

Effects of weather	...	...	...	X	...	X	...
No trauma or rheumatic disease	..	...	...	...	...	X	...
Relief with physical activity	...	...	...	...	...	X	...
Irritable bowel	...	...	...	...	...	X	...
"Jump sign"	...	X	...	...	...	...	...
Ropey muscle	...	X	...	...	...	...	X
Relief with ethyl chloride spray	...	X	...	...	...	...	X
Twitch response	...	...	...	...	...	...	X
History of trauma	...	...	...	...	...	...	X
Referred pain	...	...	...	...	...	...	X

Thompson JM (1990). Tension Myalgia as a Diagnosis at the Mayo Clinic and its Relationship to Fibrositis, Fibromyalgia, and Myofascial Pain Syndrome. Mayo Clin Proc; 65:1237-1248.

Fibromyalgia

Overview

Fibromyalgia is a common, chronic musculoskeletal condition characterized by widespread pain, stiffness and tender points. Two thirds of fibromyalgia cases develop gradually and spontaneously, without any associated trauma or work related factors. It is 8 times more common in women and may develop at any age, but mostly the third to sixth decades. Wolfe (1990) indicated some will have the onset in childhood. Fibromyalgia patients seem to be above the national average for income and education but there may be a selection bias in those who seek medical attention. It affects women 9 times more frequently than men. It commonly begins between ages 35-50, but can be seen at any age, including in children and in the elderly. The condition is often not recognized as such by many physicians because the terminology has varied over the years, and only recently has the criteria been clearly defined (1990).

The cause of fibromyalgia is not yet clear, although research has focused on the personality patterns of people who develop the syndrome, on central neurotransmitters such as serotonin and substance P, and on the associated features such as sleep disorder, which some feel may be more a cause than a result. Tender points in specific areas are characteristic, but pathological studies of the tender points have not shown any definite pathological change.

Patients with fibromyalgia often have associated conditions such as headache, paresthesiae, irritable bowel, irritable bladder and complaints of poor memory and poor concentration. Although many of the patients have depressive symptoms, it is not clear whether major depression episodes are more common in fibromyalgia.

There are no specific laboratory tests for fibromyalgia, and most investigations are carried out to rule out other conditions. Unfortunately, the repeated use of consultations and investigations, searching for an underlying pathological lesion, tends to increase the anxiety and concern of the patients and may be a factor in aggravating the condition and worsening the social and employment problems often associated this disorder. Tests, however, may be useful in some cases to make sure the person does not have rheumatoid arthritis, lupus, ankylosing spondilitis or osteo arthritis if any are seriously suspected. Less common disorders that may produce similar symptoms are hypothyroidism, some neurological conditions, polymyositis, polymyalgia rheumatica (seen in the elderly), depression with prominent somatic complaints, and overt malingering. One condition that is probably related to fibromyalgia, but defined separately, is the myofascial pain syndrome, which has a more localized pattern of pain, stiffness and trigger point tenderness.

Management is a combination of education, exercise, muscle relaxation techniques and the use of mild analgesics and antidepressant medication.The patient needs explanation and reassurance that they do not have a serious underlying disorder, and that it is perfectly safe and even helpful to increase their activity and exercise. Eighty percent of these patients are physically unfit (Martin, 1994) and control studies have demonstrated that cardiovascular exercise programs improve their symptoms substantially. (McCain, 1989) They are encouraged to return to normal activities and work despite pain.

Prevalence

Fibromyalgia is the third most frequent diagnosis in rheumatologic practice after osteoarthritis and rheumatoid arthritis (Cathey and Wolfe, 1986). Symptoms of fibromyalgia are the second leading cause of work related disability in the United States (Cathey and Wolfe, 1986) and occurs in 6% of medical outpatients and 20% or rheumatology patients. Martin (1994) suggests between 10-15% of the dult population have this disorder.

Prevalence estimates in the general population exhibit high variability ranging from a low of 0.66% (Prescott et al, 1993) to a high of 11.2% (Croft et al, 1993). A prevalence survey in a small Norwegian town by Forseth & Gran (1992) lies closer to that of Croft (1993) at 10.5%. Goldenberg (1993) reports a prevalence estimate of 10.5% among women between the ages of 20 - 49 years in Norway. This is a common disorder, and I suspect it will be shown to be even more prevalent when physicians are more aware of the criteria and examination findings of fibromyalgia.

American College of Rheumatology 1990 Criteria for the Classification of Fibromyalgia*

1. History of widespread pain. Definition: Pain is considered widespread when all of the following are present: pain in the left side of the body, pain in the right side of the body, pain above the waist, and pain below the waist. In addition, axial skeletal pain (cervical spine or anterior chest or thoracic spine or low back) must be present. In this definition, shoulder and buttock pain is considered as pain for each involved side. "Low back" pain is considered lower segment pain.

2. Pain in 11 of 18 tender point sites on digital palpation.
   Definition: Pain, on digital palpation, must be present at least 11 of the following 18 tender point sites:

   Occiput: bilateral, at the suboccipital muscle insertions.
   Low cervical: bilateral, at the midpoint of the upper border.
   Trapezius: bilateral, at the midpoint of the upper border.
   Supraspinatus: bilateral, at origins, above the scapula spine near the medial border.
   Second rib: bilateral, at the second costochondral junctions, just lateral to the junctions on upper surfaces.
   Lateral epicondyle: bilateral,, 2 cm distal to the epicondyles.
   Gluteal: bilateral, in upper outer quadrants of buttocks in anterior fold of muscle.

Greater trochanter: bilateral, posterior to the trochanteric prominence.
Knee: bilateral, at the medial fat pad proximal to the joint line.

Digital palpation should be performed with an approximate force of 4 kg/ For a tender point to be considered "positive" the subject must state that the palpation was painful. "Tender" is not to be considered "painful".

- For classification purposes, patients will be said to have fibromyalgia if both criteria are satisfied. Widespread pain must have been present for at least 3 months. The presence of a second clinical disorder does not exclude the diagnosis of fibromyalgia.

Source: Wolfe F, Smythe HA, Yunus MB, et al (1990).The American College of Rheumatology 1990 Criteria For The Classification of Fibromyalgia

Diagnosis

In 1986 a consortium of centers interested in fibromyalgia began a study of criteria for the diagnosis of primary and secondary fibromyalgia and this was very helpful in gaining understanding of the concepts. However, because of some weaknesses in the criteria, another committee reported in 1990 on behalf of the American College of Rheumatology and proposed a criteria for the classification of fibromyalgia. These criteria are 1) wide spread pain in combination with 2) tenderness at 11 or more of the 18 specific tender point sites. They propose that the term primary and secondary fibromyalgia be abandoned (Wolfe et al, 1990).

Fibromyalgia has gained acceptance as a concept and a syndrome to explain a common pattern of complex symptoms often given various names in the past.The symptoms include widespread pain, and may have associated features such as fatigue, headache, irritable bowel, depressive symptoms and sleep disturbance. Unlike rheumatoid arthritis which has similar widespread pain, no definite pathology or abnormal laboratory tests are characteristic of fibromyalgia and no specific cause has been accepted. Therefore clinicians have agreed on the constellation of symptoms that define the syndrome, and the only characteristic physical finding, the presence of specific tender points in certain anatomical locations.

Patients with the syndrome of fibromyalgia were often referred to as fibrositis, fibromyositis, myofascial syndrome and many other terms. In 1977 two Canadians, Smythe and Moldofsky published a paper that generated new interest in the syndrome and the number of publications and symposia on this disorder increase remarkably each year.

Pathogenesis

The pathogenesis of fibromyalgia has not only been uncertain, it has been controversial. One school emphasized that it was related to underlying tension and psychogenic factors, and despite the presence of local tender points and pain dysfunction, the emphasis was on the psychogenic basis of the disorder. (An older syndrome, defined by Dr. Allan Walters of Toronto, as the psychogenic regional pain syndrome, became rolled into the later concept of fibromyalgia and myofascial pain syndrome.)

The second school emphasized the physical or organic elements of the syndrome including neural mechanisms that might be involved in association with local physical change, even if psychological factors played a role. Dr. Hugh Smythe of Toronto (1985) emphasized the presence of widespread but specifically located tender points. There were also trigger points and taut muscle bands on examination. Bartels and Danneskiold-Samsoe (1986) has described a network of reticular or elastic fibres in the area of trigger points that may be the basis of the physical change in this disorder, but this is not yet confirmed. Dr. Harvey Moldofsky of Toronto (1986) demonstrated a characteristic EEG pattern of alpha/delta sleep in association with fibromyalgia, and with lowered thresholds to painful stimulation.

Although there were initially two schools of thought on the syndrome, it is my personal experience that those two schools still continue. Conversations with neurologists, rheumatologists and other clinicians convinces me that people fall into one of two camps — that fibromyalgia and other chronic pain syndromes are primarily psychogenic, or they are organic with psychological accompaniments, due to neurological mechanisms not yet understood.The two schools were clearly represented in a publication "Controversies in Neurology" a regular series in the Archives of Neurology. In 1988 Michael I Weintraub in an article "Regional Pain is Usually Hysterical" argued strongly that the syndrome of chronic regional pain, as represented by fibromyalgia, was an hysterical conversion reaction in 71 percent of the patients that he saw. He feels that chronic pain is the most common form of hysterical conversion reaction and that in the presence of litigation or compensation, many more males are represented, unlike the typical hysterical conversion reactions that are more often diagnosed in females. His conclusion is that tort reform was urgently required to deal with a multi-billion dollar compensation problem. He argued that compensation for pain and suffering should be capped, rather than removed, as recently occurred in California and other states and he felt there should be a two tier system of compensation, by which he infers but does not clarify that he means to separate the chronic pain syndrome due to hysterical conversion reaction from physical causes of chronic pain. (In our present state of knowledge and clinical practice, we would probably end up with much the same uncertainty, I would think.) He concludes "The influence of money cannot be underestimated". Given the current litigation climate, and the cost to society, legally, medically, and economically of CPS, he feels reform of the law and medical practice is necessary to thwart this unwarranted drain on resources. He advocates that the neurologist be the vanguard against hysterical conversion reaction as chronic pain syndrome, using MRI, CAT scans, Pet scans, EMG and thorough workups to detect hysterical conversion reaction as chronic pain syndrome. This is puzzling, as we would expect all these tests to be normal.

The other side of the debate was taken by Dr. Harold Merskey of the University of Western Ontario in London, Ontario who argued in his paper, "Regional Pain is Rarely Hysterical". He noted that there was a tendency to diagnose hysteria when symptoms do not follow an anatomical pattern or in the absence of organic signs that goes on to explain a number of circumstances in which this occurs and states "The prudent psychiatrist or other physician will not base the diagnosis of psychiatric illness merely on the absence of physical disease". He brings forth the increasing evidence about local change in the area of tender points and trigger points, and outlines neuropsychological mechanisms that may be involved, and the clinical evidence that argues against an hysterical basis. He concludes by saying that it is possible that pain may occur on a hysterical basis, but that most chronic pain patients do not meet the criteria for such a diagnosis.

Merskey (1988) citing the findings of Travell (1983), Smythe (1979), Moldofsky et al (1975) and Bartels et al (1986), points out that there is considerable evidence of underlying organic pathology accruing for chronic pain syndrome, even if all of the findings are not fully understood at this time. He cites the evidence of the repeated and consistent patterns of tender points, the alpha-NREM-ECG sleep anomaly, the presence of taut bands, and the presence in chronic pain syndrome muscle of a network of reticular fibres absent in normal muscle. Furthermore he cites the work of Wall and Wolfe with the finding that afferent neurons could change and extend to respond sometime later to noxious stimuli outside of their usual anatomical domain (expanding receptive fields). The finding of hyposensitivity to pain and the raising of thresholds is a common sequelae of long-standing intractable pain, and deep tissue afferents show greater sensitivity and longer lasting effects than cutaneous afferents in response to injury, all serve as damaging evidence to the claim of hysteria in chronic pain syndrome patients. In addition, he cites the work of Gould et al. in which 30 patients suffering the effect of acute central nervous system damage (e.g. stroke) all showed at least 1 of the 7 traditional signs of hysteria, with the mean number of hysteria signs being 3.4. Gould concluded that " ... the tests said to provide absolute evidence for hysteria totally lack validity. Merskey concedes that hysteria is possible in chronic pain and reiterates that detection of hysteria should be based on 3 signs: 1.symptoms correspond to an idea held by the patient, 2. strong positive signs are present and 3. the symptom settles a problem and may be alleviated by psychological change or environmental alterations.

Fibromyalgia is often seen as a component of many stress syndromes. Recently the Persian Gulf Syndrome has been defined to explain the symptoms in 30,000 Gulf veterans of the 700,000 individuals deployed in the Gulf War, 1990-91.They complained of fatigue, loss of memory, headache, muscle and joint pains, shortness of breath and other respiratory and gastrointestinal complaints. Interestingly, these mostly occurred in American troops, and very few UK troops have developed such a syndrome (Horton, 1994). At a recent National Institute of Health workshop on the syndrome, a number of explanation were discussed. Persian Gulf Syndrome could be related to local toxins or infections or parasites, but it could also represent an overlap of three conditions - post-traumatic stress disorder, chronic fatigue syndrome, and fibromyalgia. Although stress may have been the initiating factor, the veterans are convinced they have been exposed to chemical agents.

Immunological/Biomedical Aspects

Although initially felt to be a local disorder in the muscles and tendons, there is now a considerable body of evidence and clinical thought that this is a central biochemical disorder. Although it doesn't necessarily explain the cause of the disorder such neurochemical studies may explain the mechanism of the pain, sleep disorder and other symptoms. The leading hypothesis suggests there may be a deficiency in the central nervous system of the neurotransmitter serotonin, (Moldofsky, 1976; 1978; 1982; Van Kempen, 1992; Russell, 1986) but not all agree (Krantz, 1992).

The suspected role of serotonin in fibromyalgia is of interest and the evidence for its support is mounting. It is believed that a serotonin deficiency plays a multi-faceted role in the symptomatology of fibromyalgia and there have been preliminary links of depleted serotonin to painful bowel complaints, increased pain sensitivity, anxiety, sleep disturbance, depression, dysesthesia, hypothyroidism, weather related effects, and immunological disruptions, all of which appear to have some association with fibromyalgia (Russell, 1987; 1989). He reports that in a series of 9 fibromyalgia patients, serum serotonin levels were significantly lower than matched controls. It is hypothesized that due to the serotonin deficiency, platelet cells respond by producing more serotonin receptors for the re-uptake of serotonin from the plasma.Thus plasma serotonin is depleted. Russell reports on a series of 22 fibromyalgia patients who showed significantly higher receptor densities in their platelets than pain free matched controls.

It is also of interest to note that many of the drugs that have had some value in fibromyalgia such as amitriptyline and cyclobenzaprine inhibit the metabolism of serotonin. Alprazolam can be useful in fibromyalgia, and in patients taking Alprazolam and Ibuprofen had normalization of the density of serotonin re-uptake receptors on their peripheral platelets.

Other studies of antibodies, (Jacobsen, 1990) natural killer cells, and interleuken-2 (Hader, 1991) are of interest but haven't clarified the mechanisms as yet. It has also been noted that substance P is three times as high in the CSF of fibromyalgia patients compared to controls (Vaeroy, 1988). Substance P exerts a dampening effect on discharges of sensory nerves in the presence of normal or high levels of serotonin. If serotonin levels are low, substance P fails to exercise that control, so that incoming painful signals may be amplified.

Ferroccioli et al (1990) state that overall, 62% of fibromyalgia patients showed one or more hormone disorders, thus their first conclusion was that a subset of fibromyalgia patients show endocrinologic abnormalities, namely cortisol nonsuppression to DXT and hyperprolactinemic response to TRH. No correlation was found between depression and neurohormonal findings, but a strong correlation was found between stress and high cortisol level among fibromyalgia patients.

There appears to be plenty of anecdotal evidence about the effect changing weather conditions have on the worsening of fibromyalgia symptoms. However, these reports do not seem to stand up under more objective scrutiny. In an investigation of the effect of positive and negative ion exposure to serotonin sensitivity Dowdall and DeMontigny (1985 in Russell, 1989) exposed rats for 21 days to an environment charged with the respective ions. Exposure to negative ions caused an increase in neural sensitivity to serotonin whereas exposure to positive cause a decrease. These results may offer some explanation to changing pain sensitivity to electrical storms or to daily activity.

Measurements of Fibromyalgia

As indicated, a criteria has been agreed upon for the diagnosis of fibromyalgia syndrome. Once a diagnosis is established it is then difficult to quantify the degree of pain and discomfort and to monitor the change with therapy. Pain is a very individual and personal symptom, and difficult for others to assess or quantify.

A number of methods have been used to have patients self-report the degree of pain. The visual analog scale (VAS) uses a 10 cm horizontal line with one end labelled "no pain" and the other end labelled "severe pain". The patients marks a point on the line that they feel represents the degree of pain they are experiencing. It is usual to ask the patient to indicate on the line the degree or severity of pain they have experienced over the past week. Von Korff (1992) developed a Chronic Pain Grade to assess patients perception of pain.

Another way of assessing fibromyalgia is to have the clinician press on the tender points with about four kg of pressure and note the verbal and expressive response in the patient. A five point scale from 0 to 4 indicates the degree of tenderness (see Table: Palpation Tenderness Severity Scale and Tender Point Index) (Russell, 1990).

Another semi-objective measure is the Dolorimeter Pain Index (DPI). A spring loaded gauge instrument is pressed against a tender point until the patient reports a change in the sensation from pressure to pain. That pain threshold is usually above 4 kg in normals, but less than 4 kg in fibrymyalgia syndrome patients. All of the methods have some disadvantages and some crudeness in their measurements, but at least they provide some basis for monitoring how the patient is improving with treatment.

Items Comprising the Physical Activity Scale From the Aims

Item No	Description
1	Are you unable to walk unless you are assisted by another person or by a cane, crutches, artificial limbs or braces?
2	Do you have any trouble either walking one block or climbing one flight of stairs because of your health?
3	Do you have any trouble either walking several blocks or climbing a few flights of stairs because of your health?

4 Do you have any trouble bending, lifting or stooping because of your health?

5 Does your health limit the kind of vigorous activities you can do such as running, lifting heavy objects or participating in strenuous sports?

Baurmstark KE, Buckelew SP, Sher KJ, et al (1993). Pain Behavior Predictors Among Fibromyalgia Patients. Pain; 55:339-346.

The key to diagnosis is fibromyalgia is careful history and physical examination of the musculoskeletal system. The history will determination the location of pain, its duration, severity and modifying factors and any associated features such as joint swelling or redness. Tender points could be identified with careful examination, particular in the cervical, paraspinous, trapezius, pectoral, gluteal muscles, and over the lateral epicondyles, greater trocanters, over the anserine bursae of the knees and at the top of the Achilles tendons. It is useful to give similar attention and pressure on other areas as a "control" to verify the findings.

As reviewed by Russell (1990), the severity and pain experience of fibromyalgia is similar to rheumatoid arthritis. Indeed, pain ratings by 3 instruments, Visual Analogue Scale (VAS), Pain Rating Index of the McGill Pain Questionnaire (MPQ-PRI), and the number of Tender Points, showed that fibromyalgia patients had significantly more pain than either rheumatoid arthritis patients or chronic low back pain patients. Because many health care providers regard rheumatoid arthritis as a serious painful disease justifying care, sympathy and attention, similarly they may regard fibromyalgia as a minor, self-perpetuating manifestation of a complaining patient, regarded with some irritation and even derision. Also, the patients with rheumatoid arthritis are given diverse and often powerful treatments and medication, but seldom are fibromyalgia patients felt to justify anything but mild and benign approaches. Russell argues that patients seem to experience similar degrees of pain and suffering, and perhaps should be thought to be similar in their discomfort and treated more similarly. On the other hand, Russell also argues for some personalization of treatment, recognizing the individuality of each patient.

Concurrent or Precipitating Conditions

Most patients with fibromyalgia do not associate their disorder with injury or the workplace. In a study by Greenfield (1992) in Montreal only 29 of 127 patients (23 %) of people with fibromyalgia reported having trauma, surgery or a medical illness before the onset of fibromyalgia. Patients in this group were more disabled than those without such a history, resulting in a loss of employment in 70%, disability compensation in 34%, and reduced physical activity in 45%. They concluded that when fibromyalgia is related to a precipitating event the problem is more prolonged and disabling, and with considerable social and economic implications. Only 11 of the 127 patients with fibromyalgia received compensation.

Goldenberg (1993) reports on 4 concurrent or associated conditions. Among patients with Lyme disease, 8% subsequently develop fibromyalgia (although it may be a relationship, the 8% figure is in the range reported in the general population). Eleven percent of confirmed cases of HIV infected individuals develop fibromyalgia, again not much above the prevalence studies of the general population. Twenty-three percent of fibromyalgia cases could identify a specific precipitating event such as surgery, trauma (e.g. MVA), or injury (Greenfield, 1992). It was also noted that a subset of patients with systemic lupus erythematosus showed fibromyalgia.

Waylonis and Heck (1992) surveyed 554 fibromyalgia patients and 169 controls. The study consisted of self report on a wide range of factors from various axes including, demographics of the individual, medical history, exercise, family history, and medications. Statistically greater prevalence on 20 of 23 items, from the medical history axis, was reported for fibromyalgia patients versus controls. These included such items as bursitis, chondromalacia, constipation, depression, diarrhoea, tempromandibular joint dysfunction, vertigo, stomach ulcer, sinus and thyroid problems. Twenty-eight of 30 items were found to be significantly more frequent among fibromyalgia patients than controls on the symptom history axes. These include: costochondritis, chronic fatigue, concentration problems, memory problems, muscle fatigue, nervousness, rib cage pain, sexual dysfunction, sleep disorder, short temper, stiffness, tachycardia, trigger points, and weakness.

In a recent paper, Bennet (1994) indicated that patients with fibromyalgia had a number of non-rheumatic symptoms that should be recognized when managing these cases:

- severe fatigue - 95%
- irritable bowel - 50%
- myofascial headache - 45%
- unexplained bruising - 40%
- restless leg syndrome - 40%
- unexplained paresthesia - 35%
- primary Raynaud's - 30%
- vascular headaches - 25%
- female urethral syndrome - 20%
- unexplained dizziness - 15%
- sleep apnea - 10% (40% in males)

Self-Reported Complaints in Patients with Primary Fibromyalgia Syndrome and Controls

	FS			Controls
	Whole Group	AHI<5 #	AHIΔ5 #	
Number	40	10	10	10
Headache more than one time/wk	93***	100*	90*	40
Memory disturbances	70	70	70	40
Concentration problems	55*	60*	50	10
Muscular pain, general	100***	100*	100*	40
Muscular pain, neck	100**	100*	90	50
Muscular pain, back	85***	90**	80*	10
Muscular pain, low back	85*	90*	100*	40
Muscle aches and stiffness	93**	100*	90	10
in the morning Bruxism	25	20	30	30
Muscle cramps in the legs while falling asleep or during sleep	50	50	50	30
Difficulties falling asleep	65*	60*	60*	10
Difficulties maintaining sleep	78	80	70	50
Early morning awakening	65***	80*	70*	0
Tiredness/fatigue	78**	80*	70	20
Snoring	45	50	40	40
Generally in a bad mood	80**	80	70	40
Feeling morning depressed	63**	70*	80**	10
Work problems	85***	70*	90**	10

Polysomnography was performed in 20 of the 40 patients with fibromyalgia syndrome. p values in comparison to controls: $p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$.

Jennum P, Drewes AM, Andreasen A et al (1993). Sleep and Other Symptoms in Primary Fibromyalgia and in Healthy Controls. J Rheumatol; 20(10):1756-1759.

Sleep and Fibromyalgia

It has long been recognized that patients with chronic pain do not have normal sleep. This assumption precluded any serious interest in examining the relationship of sleep and chronic pain until Moldofsky (1975, 1976, 1978, 1982, 1986, 1989) asked, how do sleep and pain relate in those people who suffer chronic pain, yet show no identifiable organic origin for their pain.

In fact, the frequent reports of disturbed sleep in fibromyalgia patients has resulted in this being adopted as one of the core features of the syndrome (Jennum et al, 1993). Thus nonrestorative or unrefreshed sleep is a common symptom of fibromyalgia. In a study of 92 women and 25 men with a recent diagnosis or fibromyalgia, 44% of the males and 2.2% of the females showed sleep apnea. In particular, certain physiological anomalies have emerged as strong features of fibromyalgia. Three of the most prominent ones relate to ECG wave patterns during sleep, and an imbalance in 2 neurotransmitters, serotonin and substances-P.

Moldofsky (1989) uses the lengthy term, alpha electroencephalographic non-rapid eye movement sleep anomaly (or alpha-EEG-NREM sleep anomaly, for short) to describe the unusual EEG wave pattern observed during sleep of fibromyalgia patients. Fibromyalgia patients show an average of 60% of alpha-EEG sleep during NREM sleep, as compared to only 25% on average for non-fibromyalgia patients. Moldofsky interprets this as being indicative of an arousal disorder during sleep and a biological marker of nonrestorative sleep. He cautions that although the alpha-EEG-NREM anomaly appears to have a high sensitivity to detecting fibromyalgia patients, it lacks high specificity, since other patients who do not have a fibromyalgia diagnosis may show this feature (rheumatoid arthritis).

Pharmacological manipulations of sleep EEGs by Moldofsky (1989), further implicate alpha-ECG sleep anomaly as a factor in non-restorative sleep and increased pain. This investigation showed that the amount of alpha frequency during sleep correlate with an overnight increase of pain, hostility, and decreased energy. By contrast, the amount of delta frequency during sleep correlates with an overnight decrease in pain, hostility, and increased energy. Also, fibromyalgia can be created in healthy subjects by selective sleep deprivation, which lead Moldofsky to postulate that the sleep disturbance may come first (Moldofsky, 1986).

Two primary sleep pathologies are also associated with fibromyalgia, obstructive sleep apnea and sleep related periodic involuntary leg movements. Furthermore, those with involuntary leg movements, and fibromyalgia symptoms were more likely to be female, have more pain, morning fatigue and show the alpha-EEG sleep anomaly than those who complained of only daytime fatigue (Moldofsky, 1984 & 1986, in Moldofsky, 1989).

In a more focused examination of psychological stress and fibromyalgia, Moldofsky (1989) reports on 3 studies. First he states that is his first report (Moldofsky, 1975) on alpha-EEG sleep anomaly and fibromyalgia, all patients indicate a major stressful event at the onset of sleep disturbance, mood and musculoskeletal symptoms. In the second study (Saskin, 1986 in Moldofsky, 1989) 11 patients who incurred a minor automobile, or industrial accident, and present with fibromyalgia-like symptoms, were compared with fibromyalgia patients who could not identify a traumatic event prior to fibromyalgia onset. The alpha-anomaly was present in the accident victims, but to a lesser degree than the non-traumatic-event fibromyalgia patients. In the third study (Saskin, 1987 in Moldofsky, 1989), a comparison of 21 post-accident patients to fibromyalgia patients showed an association between the alpha-EEG sleep anomaly and pain and fatigue symptoms.

The effect of litigation on fibromyalgia was also considered. Fifteen people with unresolved litigation were compared with 6 people who had resolved their legal proceedings. The study showed no confounding effect on the severity of symptoms or alpha-EEG-NREM sleep anomaly (Saskin, 1987 in Moldofsky, 1989).

Pathology/Pathophysiology

The role of muscle pathology remains controversial. "Rubber band" morphology was present in 63% of fibromyalgia patients (Goldenberg, 1993). Muscle endurance was diminished in fibromyalgia patients versus patients with myofascial pain syndrome. No muscle abnormalities were detected with MRI in 10 fibromyalgia patients. Yunus (1989) reports that virtually all studies reviewed suffered from methodological difficulties. Yunus (1989) also reports that a few well controlled studies indicate the results of light microscopy, electron microscopy, and histochemical investigation to all be negative or inconclusive.

Mengshoel (1990, in Goldenberg, 1992) reports deficits of muscle function in primary fibromyalgia patients. Specifically he found reduced muscle strength and reduced ability to perform dynamic and static endurance work. Similarly, Jacobsen (1991, in Goldenberg, 1992) indicates that both isokinetic and isometric muscle strength were less than 50% of normal controls, indicating that normal muscle function is compromised in fibromyalgia. It had been suggested that increased muscle sypathetic nerve discharge may be part of the underlying mechanism for the chronic pain syndrome of fibromyalgia but recent studies in Sweden could not confirm any muscle sympathetic nerve overactivity (Elam, 1992).

Psychological Factors

The function of psychological factors remains controversial, and conflicting results are reported in Goldenberg, 1993. He found that fibromyalgia patients had more major depression and anxiety disorder, both personally and in their families, relative to rheumatoid arthritis patients. As well, there was a high prevalence of migraine (55%), irritable bowel syndrome (52%), and chronic fatigue syndrome (70%) among fibromyalgia patients, also noted by Yunus (1985). Contrary to Goldenberg, Ahles et al (in Goldenberg, 1993), found no difference in major depression in a comparison among fibromyalgia patients, rheumatoid arthritis patients and healthy individuals. Fibromyalgia patients showed significantly more depression than chronic low back pain patients, but similar scores to rheumatoid arthritis patients (Ferraccioli et al, 1990).

Fibromyalgia patients scored higher than rheumatoid arthritis patients on 9 out 10 subscales of the MMPI (Payne et al, in Boiessevain, 1991). Six of these differences were statistically significant, and 2 were in the pathological range. He cautions that these results may be spurious due to improper statistical controls and failure to account for patient severity. Ahles et al (in Boissenvain, 1991) in a study similar to the Payne study found fibromyalgia patients scored significantly higher than rheumatoid arthritis patients on 4 MMPI subscales, but no scores were in the pathological range. Neither study found a significant difference between fibromyalgia and rheumatoid arthritis patients on the depression scale. However, Birnie et al (in Goldenberg, 1993) found fibromyalgia patients had similar scores as chronic pain patients on 3 psychological profiles.

A "fibromyalgic personality" is unlikely. Boissevain and McCain (1991) point out that although the notion of a fibromyalgic personality is promoted by some, e.g. Smythe, 1985 (in Boissevain and McCain) it has little support. Ahles also examined their data for possible "profiles" and found that 31% of fibromyalgia patients were "psychologically disturbed" (although this doesn't indicate whether the changes are a cause, a result or unrelated to the pain syndrome). Wolfe et al (in Boissevain, 1991) indicate similar findings in a comparison among fibromyalgia patients, and rheumatoid arthritis patients, in which there was no differences in groups scores on 3 psychological testing instruments. Although, once again fibromyalgia patients tended to score higher than any other group and did score significantly different for anxiety and depression on one subscale. When anxiety and depression are specifically examined in the context of negative affect and fibromyalgia the results are inconsistent.

Kuch (1993) investigated 61 subjects (26 males, 35 females) with fibromyalgia, and found depression related to pain frequency but not to intensity. Anxiety was not related to either pain frequency or pain intensity. Two measures, disability, as rated by a physician on the Sheehan Scale, and self-rated impact of illness, as assessed by the Sickness Impact Profile (SIP), both correlated significantly with severity of depression and severity of anxiety. Although these findings draw attention to the psychological aspect of fibromyalgia, Boissevain (1991) is quick to emphasize that they do not answer the crucial question of whether psychological disturbance is of causal or consequential significance to fibromyalgia.

Moldofsky (1989) also comments on 2 studies of Israeli war veterans suffering from combat stress. Both studies (Lavie, 1979 & Solomon, 1987 in Moldofsky, 1989), indicated that soldiers who suffered from combat stress reported more fibromyalgia-like symptoms than soldiers who did not.

Goldenberg (1989), in a comprehensive review of several studies examining the association of psychiatric illness with fibromyalgia indicates that conflicting results seem to be the norm. Despite the variable outcomes, there seem to be some common findings.

Fibromyalgia patients seem to consistently score higher on various subscales of the MMPI, for hypochondriasis, hysteria and depression, than the general population, but this may in a large part be a reflection of the presence of chronic pain (Merskey in Wall, 1994). However they do not vary much from other chronic pain suffers, such as rheumatoid arthritis patients. Similar results are seen for several other psychological tests such as The Family Inventory of Life Events, Multidimensional Health Locus of Control, Beck Depression Inventory, SCL-90-R, Trait Anxiety Inventory and others (Wolfe, 1984, Alhes, 1984, Clarke et al. 1985, in Goldenberg, 1989).

The use of the MMPI is common among studies investigating fibromyalgia and psychological disturbance. Fibromyalgia patients often show higher scores than controls on the hypochondriasis, and hysteria scales and sometimes higher than rheumatoid arthritis patients, thus leading several workers to conclude that fibromyalgia patients were "psychologically disturbed." The use of this scale is questioned by Goldenberg (1989) as several of the questions on these subscales relate to somatic complaints. Thus, the subscales may be tapping into chronic organic disease, rather than psychiatric illness. This failure to distinguish between organic and nonorganic illness by several of these instruments leads Goldenberg (1989) to assert that the conclusion of "psychological disturbance" may be unwarranted.

Goldenberg (1989) focused on depression as it relates to fibromyalgia, with some interesting findings. Life time history of major depression was found in 71% of fibromyalgia patients versus 13% in rheumatoid arthritis patients and 12% in normal controls. Furthermore, it was found the that the onset of major depression occurred before the occurrence of fibromyalgia symptoms in 64% of those studied. Although this suggests that depression may be causally related to fibromyalgia, Goldenberg points out that only 26% of the fibromylgia patients were currently depressed. In addition, the risk of major depression among first degree relatives and the percentage of probands with a history of major depression were both significantly greater in fibromyalgia patients than rheumatoid arthritis patients. In contrast, both Ahles (1987, in Goldenberg, 1989) and Kirmayer et al (1987 in Goldenberg, 1989) found, respectively, no significant difference in self-rated depression, or lifetime history of depression between fibromyalgia and rheumatoid arthritis patients.

Goldenberg (1989) concludes by asserting that the research on fibromyalgia and psychiatric associations has methodological problems and that "... current studies do not allow us to differentiate whether that pain is related to disease activity or to an inherent psychiatric state." and that prospective studies are required to sort out the temporal relationship of chronic pain associated with fibromyalgia and psychiatric symptoms.

Myofascial Pain Syndrome

Diagnosis

Kruse et al (1992) used thermographic techniques to test the diagnostic significance of thermographic imaging in cases of myofascial pain syndrome (MPS). Thermographic imaging was performed on 11 MPS patients and 11 controls. Kruse et al. concluded that thermographic imaging may be useful for diagnosing trigger points in MPS as there was a significant temperature decrease, as detected by thermography, in the effected area after compression of the painful site, but this is unlikely to be practical in clinical practice, and still contraversial. I feel that this is an unwarranted, and expensive, procedure when a thorough physical examination would suffice.

To what extent does depression influence the severity and catastrophizing? Sullivan & D'Eon (in Flor et al, 1993) concluded that catastrophizing may be more related to depression than to pain. However, Flor et al (1993), conclude that although depression and catastrophizing seem to be related precise nature of the relationship remains to be determined.

Cassisi et al (1993) compared 151 patients, 94 with myofascial pain syndrome and 57 with herniated discs, for perception of their pain, degree of disability, and psychological aspects of their pain. Herniated disc patients were more likely to report periods of pain relief than patients with myofascial pain syndrome.

Significant differences were found in both myofascial pain syndrome and herniated disc patients who were receiving workers compensation benefits compared to those who were not. Those who were receiving benefits differed significantly on 5 variables: total pain, pain at its worst, disability, global severity index, phobia and paranoia.

Thus patients who receive workers compensation reported more pain, disability, and psychological disturbance. From these, and similar results it has been argued that workers compensation promotes this behaviour, but then again one might expect that those who indeed have more severe, or persistent injury and sequelae would more often be on compensation.

Swerdlow and Deiter (1992), investigated the use of thermography as a diagnostic tool in the assessment of myofascial trigger points. A total of 365 patients were enroled in 4 distinct experiments evaluating the use of thermography. Unfortunately, none of the experiments showed any significant relationship between thermographic hot spots and patients with and without trigger points. This study did not support the notion that thermographic hot spots locate active upper back hot spots, in myofascial pain syndrome patients.

Repetitive Strain Injury

Repetitive strain injury is the consequence of tissue damage to muscles and muscle tendons, usually in the upper limbs due to repetitive activity or postural constraint which activates local nociceptors in a particular area of muscles and tendons. Well known examples are seen in the shoulders and arms of people who use keyboards continuously, work with their arms and hands above the horizontal, screw drivers, etc. Various terms have been used including cumulative trauma disorder, occupational syndromes, occupational overuse syndrome and repetitive strain injury. Various syndromes have been described in the medical literature, and a decade ago there was a continual flurry of specific syndromes in the letters column of many journals.

Littlejohn (1989, 1994) has reviewed this syndrome and argues that the object of management should not be directed to the incorrect assumption that the problem is tissue damage in the periphery, but rather to the central sensitization. He notes that the syndrome can be successfully treated using good principles of pain management, but that it may persist if attention is directed just at local areas of pain. He also notes that the problem will often persist if it is an adversarial situation. Although prevention involves looking at various ergonomic factors in the workplace, other factors may be just as important, including a knowledge of the individual's response to pain, and the potential for pain amplification in emotionally charged situations such as the workplace. He also notes that other factors include a compensation system that may allow people with minor complaints to receive financial support. He concludes, "The psychosocial issues involved in repetitive strain injury are the most important and require an objective and mature approach to the problem to ensure minimization of this costly problem, both in financial terms to the community and particularly in health and suffering terms to the individual and their family."

Chronic Fatigue Syndrome

Goldenberg (1991) notes that there is considerable overlap between patients diagnosed with chronic fatigue syndrome and fibromyalgia. In a survey of 27 chronic fatigue syndrome patients 19 (70%) met criteria for fibromyalgia.

It is not our intention to outline or detail the many observations and writing on chronic fatigue syndrome, but it is important to note the increasing comments in the medical literature that relate chronic pain and fibromyalgia to the features of chronic fatigue syndrome. Many note the similarity and overlapping nature of these problems.

Moldofsky (1994) noted that fibromyalgia and chronic fatigue syndrome share similar symptoms and disordered sleep physiology. People with these illnesses show EEG arousal disturbances during nocturnal sleep. These disturbances result in non-restorative sleep that accompany the temporal variation of the waking experience of fatigue, myalgia and psychological difficulties. Moldofsky noted that because the neuro-endocrine, immune and thermal systems are ultimately linked to the sleep-wake system, disturbances in the circadian regulation of one may affect the other.

A cause of chronic fatigue syndrome has not been found. A similar syndrome, post viral fatigue syndrome, is thought to result from an acute viral infection. Another variation, myalgic encephalomylitis is thought to be an acute viral infection, often occurring in epidemics. Hyde et al (1994) studied 1826 patients with these syndromes and noted that over 90% of them experienced pain as an integral component of the illness, again indicating the overlap with chronic pain syndrome and fibromyalgia. They noted that multiple family illness was not common. Teachers and hospital workers were particularly vulnerable, whereas professions with a high percentage of females, but low contact with close and repeated infectious illness, demonstrated a low incidence of the syndrome, perhaps implying a viral etiology. They also noted that the years 1984-1989 appeared to be a pandemic period. Disturbingly, only 2% of the patients noted total recovery.

MANAGEMENT OF CHRONIC PAIN

> "The best treatment for low back pain pain without radiation or objective clinical signs is work."
>
> Report of the Quebec Task Force on Spinal Disorders in the Workplace

General Discussion

> "The most important aspect of therapy, as with any chronic pain condition, will always be a humanistic, caring physician available to provide the education, support and guidance to deal most effectively with a prolonged, frustrating disorder"
>
> Goldenberg (1989)

One of the frustrations in the treatment of chronic pain is the confusing array of therapeutic modalities, and the conflicting reports on their success. A look at the diverse medical literature would make one reach the paradoxical conclusion that in the hands of enthusiasts, every form of therapy seems to be effective, whereas the overall results of treatment are poor, and nothing really seems to work well. Recently, Bombardier (1994) did an independent blinded review of 94 trials retrieved from Medline, Embase and Science Citation from 1972 to 1992 and identified 28 articles meeting prespecified inclusion-exclusion criteria.The results, in her paper entitled "Everything Works", noted that overall non-drug therapies (acupuncture, cognitive and hypnotherapy) have larger effect size than drug therapies. Among drug therapies, antidepressants were more beneficial than NSAIDS which show positive but small benefits. However, she noted that evaluating such trials was confounded by the lack of standardization of outcome measures.

Pain centers vary considerably in their approach to the treatment of chronic pain. Consequently, a pain patient is offered a wide assortment of options when seeking a remedy. Csordas and Clark (1992) reviewed the practices of 25 pain clinics in an urban setting and assessed them for variations. Pain centers were found to vary on the following characteristics: institutional affiliation, professional background of the staff, treatment modalities offered, population served, patient selection criteria, types of pain condition treated and diagnostic and etiologic frames of reference. The chronic pain patient faces the doubly frustrating situation of physical discomfort and the quest for effective relief. After multiple physician visits and testings, without satisfaction, they may be comforted to discover that there are specialized pain centers that deal with such conditions. However they often do not realize that there is a large diversity in the types of treatments offered and the types of health care professionals offering them. Moreover they are often created under the auspice of differing "... philosophies and understandings of what chronic pain 'really is'" (Csordas & Clark, 1992).

With the burgeoning acceptance of chronic pain as a real entity and the rapidly growing number of chronic pain specialty clinics, there are concerns about accreditation. The argument for accreditation is usually to safe guard against quackery. However, Csordas and Clark (1992) question whether accreditation would be beneficial overall:

> "It is thus fair to question whether the result would be not the setting of standards, but the imposition of standardization, thus removing the possibilities of patient choice and practitioner diversity and flexibility. Such standardization is premature in the light of the current lack of knowledge about the efficacy or possible side-effects of specialized chronic pain treatment."

Csordas & Clark (1992) also raise the point that with an increasing number of certified pain centers there will be an increasing number of people with institutionally validated illness or disability attributed to chronic pain. This increased number of "disabled" people would place a severe strain upon the health care, compensation, and social welfare systems. Furthermore it may deem some people disabled whose condition would otherwise be remediable. They were surprised at the number of respondents to their survey who described their centers as 'the end of the line' for patients who have exhausted every other avenue in their search for care. Given the variation and lack of evaluation in pain centers they doubt whether "end of the line randomly chosen by a particular person may not be a painful dead end." (Csordas & Clark, 1992).

One can develop a successful approach to the management of chronic pain as long as we adopt an appropriate interpretation of what chronic pain is, and a method of management and a series of clinical goals and markers of success that are specific to this problem.

Russell (1990, 1991) argues that patients should know the limitations of treatment, and that the goal is to reduce the severity of pain and the periods of discomfort, and the therapist and patient should enter a "management partnership" with both working together to resolve the problem as best they can. He feels that the patient should feel they are receiving appropriate understanding and attention, with regular scheduled visits and a positive approach to improvements. When the patient is consciously or unconsciously working against the therapy and a positive outcome, the therapy is likely to fail, and the therapist to become frustrated and irritated with the patient.

Clifford outlines models of management:

> **Medical management:** This is based on the presumption of tissue damage and the goal is usually to cure and alleviate the pain.
>
> **Convalescence:** This is a period of rest following the acute illness or trauma.The goal is gradual recovery of health and strength.
>
> **Functional management:** This includes physical, psychological and vocational rehabilitation. The goal is increased function, not alleviation of pain.
>
> **Rehabilitation:** This is a progressive, dynamic, goal-oriented and often time-limited process that enables an individual with an impairment to identify and reach an optimal mental, physical, cognitive and social functional level. The goal is for the individual, family and community to accommodate a limitation or loss of function, and encourage social integration and independence.

After an injury it may be appropriate to go through a sequence of these management strategies. Medical management is used to take care of the immediate injury. There is a period of convalescence and attention should be given to any signs that this is not occurring as expected. Functional managment is used to return the person to increasing activity and back to employment. Rehabilitation is necessary if the process is continuing. Unfortunately, it is common for the patient with chronic pain to be continually in a medical management mode, characterized by acute treatment strategies, drug therapy, repeated radiological investigations and repeated consultations.

> "After surgery has failed or after their primary care physician has 'given up' on them, patients arrive at a pain clinic often convinced that physicians see their problem as unreal, exaggerated, or 'all in my head'."
>
> Sullivan and Loeser (1992)

It is important that the switch from a curative model not convey to patients the notion that their suffering is imaginary or of their own doing. Rehabilitative pain treatment must tread the fine line of not holding the patient responsible for his illness, but of clearly holding him responsible for his recovery."

Self-efficacy measures in predicting treatment outcomes were investigated by Kores et al (1990) in patients suffering from chronic pain due to several causes including, chronic back pain, chronic headache, and fibromyalgia. They found that patients with higher self-efficacy scores after treatment showed less conspicuous pain-related avoidant behaviour at follow-up. Reductions were seen in both verbal and non-verbal pain behaviour, pain-related down time, and medication requirements. They concluded that self-efficacy measures are useful in determining treatment response in the management of chronic pain patients.

Duckro et al. (1985-86) evaluated the effectiveness of an outpatient pain management program by long term follow-up lasting between 24 and 33 months (mean = 31.8 months). Patients fell into one of 3 groups: those who were evaluated only, those who dropped out of treatment prematurely and those who completed the treatment program. There appeared to be no significant difference in the subjective experience of pain between these groups, however there were other notable differences. Treatment consisted of a 10 week program embracing a multidisciplinary approach including: biofeedback, group psychotherapy, group behaviour, physical therapy, occupational therapy, vocation counseling, family therapy and medication management. Those who completed the program reported significantly less use of medical resources for the diagnosis and treatment of pain, significantly greater ability to complete household and work-related tasks, and greater tolerance for exercise.

Moon (1988) in reviewing the social factors effecting the treatment of chronic pain patients in New Zealand found that there were many frustrated patients, inappropriate assessments and diagnosis were being (eg orthopaedic surgeons giving psychiatric diagnosis), and that many suffers of chronic pain having exhausted all medical avenues were now turning to their members of parliament for solutions. Upon completion of her survey Moon offers the following recommendations. First, de-emphasize the role of the orthopaedic surgeon as the sole person responsible for the assessment and treatment of chronic pain patients. Second, since chronic pain is a complex and multifaceted problem, an appropriate mechanism, for the complete assessment of the chronic pain patient, that incorporates the psychosocial as well as the biomedical aspects of the patient should be established. This assessment should be done as early as possible with the goal of rehabilitation at the forefront of management, and the establishment of rehabilitation programs to achieve this. Third, the strengthening of the general practitioner's role and the broader dissemination of information on chronic pain and it's appropriate management. Finally the fostering of a positive and trusting attitude within the people working with the chronic pain suffers.

Mellin et al (1993) investigated the long-term outcome of multimodal treatment of chronic low back pain patients. In particular they examined the role of intensive physical training as part of treatment, in the success of returning patients to the workplace. Correlations between changes in physical measurements during treatment and return to work status were calculated. Surprisingly there was little to no relationship in the improvement of physical measurements during treatment and resumption of work at 12 month follow-up. They summarizes their results saying, "Return-to-work rates were, however, modest and not considerably connected with physical progress during treatment" (Mellin et al. 1993). They also concluded that factors other than physical functioning alone, such as the quality of work life and a patients labour market prospects, are likely at play in determining success of return-to work efforts of a chronic pian patient. Edwards et al (1992) reported on the effectiveness of a multidisciplinary physically based program in the treatment of chronic low back pain patients. Treatment consisted of mobilising physiotherapy, isokenetic testing, physical reconditioning, work hardening and psychological testing. The results showed that upon 1 year follow-up 30 of the 54 patients (55%) were successfully returned to work. They concluded that physical rehabilitation programs have a vital role to play in the successful treatment of the chronic low back pain patient.

Cott et al (1990) compared the outcomes of “field” managed chronic pain patients versus office managed patients. The theory behind the study being that health care workers can better identify and ameliorate influence that might negatively effect patient outcome, when they can observe and treat them in their real day to day living and working environments. Over a 6 year period 261 patients with various chronic somatic complaints underwent multidisciplinary treatment in either field based or office based settings. They found significantly greater reduction in disability in field based (84%) management versus office based (61%). In addition, compliance among field based management was significantly higher than office based and retained its effectiveness in enhancing functional status irrespective of benefits being received.They concluded that field based management was a cost effective means of treating chronic pain patients.

Hazard et al (1989) reported on the effectiveness of a functional restoration with behavioral support program for the treatment of chronic low-back pain patient. Ninety patients, who were disabled for 19 months on average were followed for 1 year post treatment. There were 59 program graduates, 17 denied program entry by their insurance carriers, 5 dropouts, and 6 crossovers. Significant improvements were seen among program graduates in self-assessed pain, disability and depression, and in physical capacities after 3 weeks of treatment. They concluded that functional restoration with behavioral support is effective in the treatment of chronic low-back pain patients.

Initial Evaluation: The first step is to take a careful history and examination of the patient, using the principles of the multidimensional aspects of pain. It is important to review with the patient the pattern of previous consultations, investigations and treatments and assess the completeness of the assessment and therapeutic attempts. In about 5 percent of chronic pain patients a surgical solution may be found, but 95 percent will enter into a program designed for the chronic pain, with no underlying pathology evident (Swanson). In reality, the 5% are identified early in the process and later a surgical solution is rarely found.

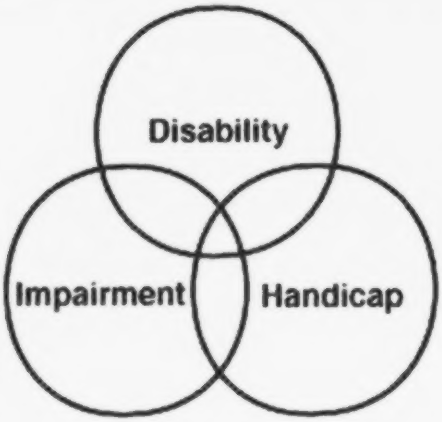
Because pain is subjective, measurements are difficult. However, various scales have been developed including the recently developed Chronic Pain Grade (Von Korff, 1992).

In the comprehensive history the physician should learn how the patient views the accident and resulting injury, and he should have an account from others or the company on how the injury occured. What led up to the accident? Has the patient had other accidents? Have similar accidents occured to others in that setting? Does the patient have a history of frequent symptoms and complaints? How is his general health? How is his emotional health? How is home life? How active is the patient and is there a regular exercise involvement? Since the accident, what is the patient’s day like? What is the use of drugs and alcohol? What does the job entail? What is the attitude toward returning to work? What are the patient’s feelings towards the workplace, fellow workers, foremen, bosses?

In the management of chronic pain the initial assessment should answer two key questions as the program of therapy goes forward. Does the pain signal tissue damage that requires specific therapy? Does the pain preclude a safe increase in function on a graduated basis?

Assessment of Ability and Activity: In the initial evaluation, particularly if the problem is related to compensation or insurance, is an assessment of the defined qualities of impairment, disability, handicap, employability and disability from work.

Interaction of Impairment, Disability and Handicap



Clifford JC (1993). Successful Management of Chronic Pain Syndrome. Can Fam Phys; 39:549-559

The World Health Organization (WHO), in 1980, set out an international classification for describing impairments, disabilities, and handicaps.

> **Impairment:** Any loss or abnormality of psychological, physiological or anatomical strucuture or function.
>
> **Disability:** Any restriction or lack (resulting from an impairment) of inability to perform an activity in the manner or within the range considered normal for a human being.
>
> **Handicap:** A disadvantage for a given individual, resulting from an impairment or disability, that limits or prevents the fulfillment of a role that is normal (depending on age, sex, social and cultural factors) for that individuial.
>
> WHO, 1980

Impairment, disability and handicap are not synonomous. Aronoff (1988) notes the lack of consistency over the use of these terms. He points out that they are often used "incorrectly and interchangeably, leading to confusion for patients physicians, and attorneys. Impairment is a medical term, referring to 'reduction of body organ function.' Disability, a legal determination, refers to a 'task specific limitation of performance.'" This is an important differentiation since the occurrence of disease is not necessarily synonymous with impairment, and the presence of impairment does not necessarily lead to disability (Aronoff, 1988).

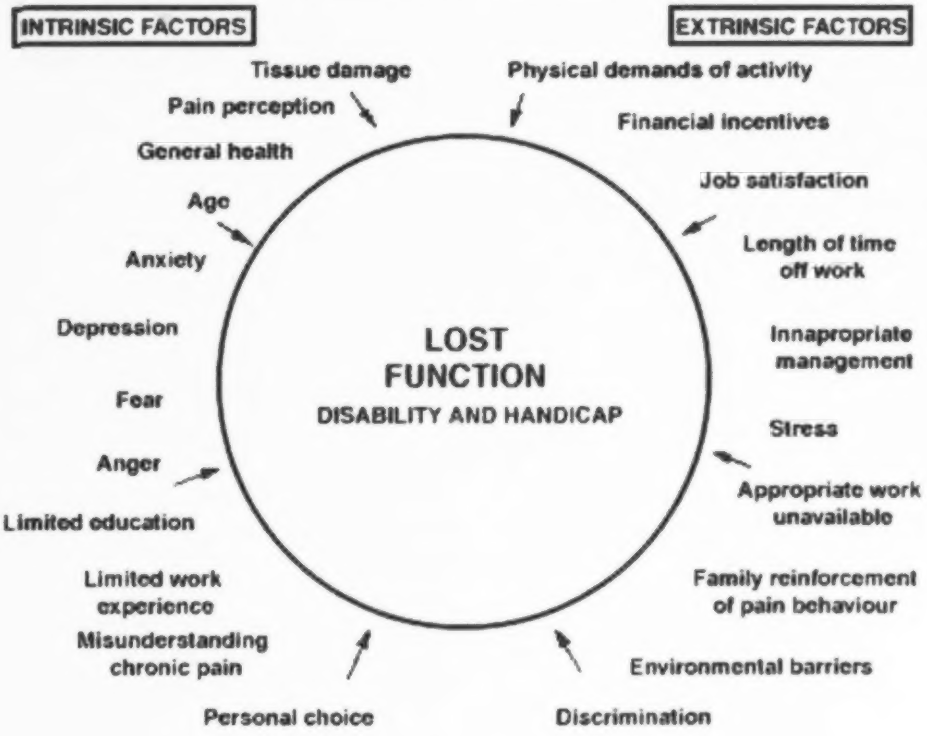
For a full discussion of this, refer to the standard document, "Guides To the Evaluation of Permanent Impairment". Fourth Edition. American Medical Association. 1994.

After an acute injury there is often tissue damage, pain, and loss of function. These are expected and usually resolve. When tissue damage heals pain resolves and function returns. However, sometimes pain continues long after the expected healing time. It is a common misconception that the reason for the continuing pain is a persistence of the tissue damage although peripheral injury can permanently alter central mechanisms. In many instances the persistence of pain is related to the inactivity created by the injury, fear and anxiety about the pain and the possibility that activity will worsen the tissue damage, and a host of psychological and social factors that may increase the liklihood and persistence of pain. It has to be understood that chronic pain usually continues in the absence of continuing tissue damage. These patients often feel that they have limitations of function that are greater than the actual dysfunction. They can often be seen to function much better than they feel they can.

Clifford notes that an assessment of chronic pain patients shows that they are almost always treated by the medical model which pursues the investigation of tissue damage or underlying lesions, and seeks to relieve pain. This tends to overutilize expensive investigations that reveal little and help little, and results in a great list of management and treatment techniques that help little. The idea that there is something being missed leads to further consultations and investigations, as if there is always some secret disorder to be revealed, and a miraculous treatment that will give relief. He also notes that there is a recycling phenemonon with patients being put through the same investigations and the same consultations, with the idea that something might turn up the next time. They are subjected to intensive treatment, and it often gets more complex as time goes on.

All of this tends to increase anxiety and suffering in the patient, accentuates the perception of the seriousness of the pain, encourages illness behavior, and tends to make the patients increasingly passive.

Factors Affecting Lost Function


INTRINSIC FACTORS
EXTRINSIC FACTORS
Tissue damage
Pain perception
General health
Age
Anxiety
Depression
Fear
Anger
Limited education
Limited work experience
Misunderstanding chronic pain
Personal choice
Physical demands of activity
Financial incentives
Job satisfaction
Length of time off work
Innapropriate management
Stress
Appropriate work unavailable
Family reinforcement of pain behaviour
Environmental barriers
Discrimination
LOST FUNCTION
DISABILITY AND HANDICAP

Clifford JC (1993). Successful Management of Chronic Pain Syndrome. Can Fam Phys; 39:549-559

The rehabilitation program should evaluate the functional aspects of the patient's condition, and apply a rehabilitation model of care. This is different than the acute medical model, in that the focus of the patient's evaluation is function and the treatment is aimed at improving the function, with the pain as the disabling problem to address. The emphasis and goals are on function, with the aspects of pain de-emphasized. It is important to indicate that you understand patients have pain, and may continue to have pain, but both the patient and therapist will have to accept that on the road to improving function. The focus is on restoring physical function and not achieving a cure.

Levenson et al (1988) grouped chronic low back pain patients, who were all receiving worker's compensation, according to their duration of disability into 3 groups: those who were disabled for less than 1 year, those who were disabled for 1 to 2 years and those who were disabled for more than 2 years. Leveson et al. found elevations on 3 MMPI subscales: Hypochondriasis, Hysteria and Depression. Analysis of variance techniques applied to these groups revealed that those disabled for greater than 2 years had significantly greater depression and psychopathology than those disabled for less than one year. They conclude that their results suggest a causative link between duration of pain and disability and psychiatric disease.

Gallagher et al (1989) investigated the determinants of return-to-work of chronic pain patients reporting to pain center for the treatment of chronic low back pain. Gallagher et al. wanted to know which of a battery of physical, bio-mechanical and psychosocial factors that determine return-to-work status at 6 months follow-up, after a pain center treatment. Of particular interest was the finding that after age and individual time out of work were controlled for, the variables of individual physical examination and biomechanical measures were not predictive of return-to-work status at 6 month follow-up. Thus Gallagher et al conclude the exclusive dependence on physical examination and its extensive use in determining disability for the purpose of compensation, without taking into account the psychosocial factors are not justified by their results.

Management of the Acute Injury and Ongoing Pain

Clifford mentions several important principles in treating soft tissue injuries:

Most heal in 3-6 months.
Healing is facilitated by movement.
Early activity encouraged functional recovery in both acute neck and acute back pain.
Ongoing pain perception can exist in the absence of tissue damage.
Ongoing pain perception need not be synonomous with loss of function.
A structured exercise program encouraged functional recovery in chronic pain.
Ongoing pain perception can deminish with increasing physical activity.

Prolonged rest and inactivity should be avoided and the patient should be encouraged to be up and mobilized early in a graduated basis. It is an important issue, as the development of chronic pain is a disasterous and long term problem with implications, not only for the patient, but for their family, their friends and their employers and society.

Patients should be sympathetically, but firmly informed of the situation and encouraged and given hope and a sense of empowerment. They should be told:

The perception of pain is real.
The pain is unlikely to be cured.
Although the exact cause and all its factors may not be exactly determined, the presence of significant tissue damage can be excluded.
It is safe and important to increase activity.
Some worsening of pain may accompany a graded exercise program.
The long term benefits of increased function are substantial.

Patients should then be moved from the medical and convalescent stages of management to the functional management, with a restorative program. This should begin at about 3 months, and the goal is to increase their function not to relieve their pain. Both the patient and physician should discuss that they are not dealing with the concepts of diagnosis and cure, and that some increases in pain may be seen during the increasing function.

Functional restorative programs have been described in detail by Mayer (1987) and colleagues and by Hazard (1989) and his associates. Behavioral and vocational objectives should be set, a schedule outlined, and a method of case management designed. Functional restorative programs are broad in their approach, and they involve the family. As teams are used, team managements are important. Interestingly, they include the patient's lawyer if legal action is being pursued, and the funding agency if that is appropriate.

There is considerable evidence that an early return to the workplace is advantageous to patients both physically and emotionally. The increased activity may be accompained by a reduction in pain, and they see a reduction in their anxiety and loss of self esteem and loss of self control over their pain and their events.

Catchlove & Cohen (1982) examined the frequency of work resumption among 2 groups of differently treated chronic pain patients receiving workers' compensation. One group of patients received an instruction to return to work as an integral part of their treatment program, whereas the other group did not. Significantly more patients (60%) who were directed to return to work, did so, compared to those who were treated the same, but did not receive the directive (20%). Other significant differences in the "directed to return to work" group were, that at follow-up (mean 9.6 months) 90% of this group were still working, they were receiving few compensation benefits, and had received less additional treatment for their pain than the non-directed group.

Werneke et al (1993) explored the effectiveness Waddell (or behavioral sign) scores in screening or predicting successful return work of chronic low back pain patients, who completed a work-oriented physical rehabilitation program. In those patients who successfully returned to work, there was a significant reduction in Waddell scores, whereas there was no significant reduction in Waddell scores for those who did not return to work. Werenke et al. concluded that Waddell scores may be useful for 2 purposes, predicting for whom a rehabilitative return-to-work program would be productive among chronic low back pain patients and for screening who would benefit from more intensive behavioral and psychiatric treatment efforts.

Because pain may occur with increasing activity, there is a tendency to reinstitute the medical model, look for increased tissue damage and move back into the investigation, treatment, consultation mode. This should be resisted and it has to be understood by the physician and patient that these exacerbations of pain are to be expected.

Warning signs of difficulties in management include.

Job dissatisfaction.
Active adversarial confrontation with employer, WCB, litagation, insurance claims, etc.
Narcotic use.
Overly dramatic verbal expressions of pain.
Overly passive interpretation of events during care, and blaming of symptoms on the care.
Bizarre reactions to medication or injections.
Steady deterioration of symptoms without a single pain free period.
Symptoms worsen by treatment.
Hostility
Symptoms of pain involving the entire spine or half the body.
Excessive displays of pain behavior

Multiple orthoses (collars, corsets, canes, TENS machines, crutches, wheelchairs, etc) A caregiver who is attentive to every need and assists with dressing Frequent emergency room attendance.

These do not indicate malingering, but they do suggest that significant psychological factors may be present which may complicate management and recovery.

Claypow (1993) and colleagues studied patients with chronic pain due to low back pain in an orthopedic clinic and found by cluster analysis that patients could be consistently grouped into three categories (pain; impairment; depression) and that these were stable dimensions over time. Patients were found to fall into one of the three groups: chronic pain syndrome with high levels of pain, impairment and depression; people with a positive adaptation to pain in that they had high levels of pain but low levels of impairment and depression; and patients with good pain control, who had low levels of pain, and low levels of impairment of impairment and depression.

Lehmann et al (1993) undertook to attempt to predict who among low back pain patients would become disabled chronic low back pain patients (DCLBP). Unlike other studies, they began with patients who were still acute back pain patients, i.e. those unable to work for more than 2 but less than 6 weeks, and who perceived their pain as work related. Patients were assessed on various personal, medical, occupational, and psychological factors to try to predict predisposition to DCLBP. Return-to-work rates were reported as follows: 40% returned to work within 2 months, 54.5% returned to work within 3 months and 83.6% after 7 months. Approximately 16% never returned to work within the follow-up period of the study. No significant correlation were found between DCLBP, and personal demographics, health factors, work-related variables, or pain and function variables. The only variable found to correlate with DCLBP was marital status, with married patients returning to work sooner. Lehmann et al. concluded that practically speaking, when trying to predict which acute low back pain patients will likely become chronic "... the optimal prediction equation appears to be: Perception that low back trouble is work related + absence from work for more than 2 weeks = High Risk Case" (Lehmann et al. 1993).

Sanders and Brena (1993) used cluster analysis to identify "empirically derived" subgroups of chronic pain patients with impressive results. Multidimensional cluster analysis revealed 4 reproducible subgroups: Cluster A - highly dysfunctional with moderate levels of physical pathology, Cluster B - moderately dysfunctional with moderate levels of physical pathology, Cluster C- highly functional with low levels of physical pathology, and Cluster D - highly dysfunctional with low levels physical pathology. Cluster-A and -D patients exhibited significantly higher levels of depression, more medication use, less activity, and were more likely to be out of work at pretreatment. Interestingly, these 2 clusters (A & D) showed the greatest improvement in pain intensity, medication use, activity level and return-to-work post-treatment. Cluster B patients showed the least improvement in outcome measures and unlike any other cluster showed no significant progress in post-treatment work status. In evidence against a "pain prone" person, cluster differences were not a function of age, sex, pain intensity, pain location, pain duration, or depression. Sanders and Brena conclude that subgroups of chronic pain patients could be reliably identified and that these could be used to guide treatment and improve outcomes.

Prevention and Chronic Pain

Linton (1987) reviewed some of the behavioral management literature on chronic pain and concluded that the most effective approach would be one of prevention. He cites a number of studies that have used behavioral approaches and notes their good to moderate short term success. Linton feels that with this sound foundation of work showing encouraging results, testing and development of effective behavioral prevention of chronic pain should be pursued with vigour.

Linton et al (1989) tested the prevention approach advocated in earlier reports. Sixty-six nurses or nurses aids who had been sick-listed with back pain at least once in the previous 2 years, but were currently working, were assigned to either a treatment group or no intervention group (ie they were put on a waiting list). The treatment group received a regime of physical activity (walking swimming, jogging, cycling etc.) for at least 4 hrs/day and physical therapy where necessary. In addition they received ergonomic training ("low back school") and behavioral therapy aimed at controlling their pain and a low risk lifestyle. The program lasted 5 weeks and the treatment and control groups were compared on several measures: daily ratings (pain, fatigue, anxiety, sleep quality), pain behaviour, activities of daily, living, depression, helplessness, martial satisfaction, absenteeism, and medication use. At the end of the 5 week program and at 6 month follow-up, the treatment showed significantly greater improvement than the control group for pain intensity, anxiety, sleep quality and fatigue ratings, observed pain behaviour, activities, mood, and helplessness. Linton (1989) concluded that over all these results were encouraging and that a secondary prevention program targeting life style factors may be an effective means of dealing with musculoskeletal pain problems.

Linton (1989) points out the musculoskeletal complaints of pain in the neck, back and shoulders are often attributed to physical and ergonomic factors, but little attention has been paid to psychological factors. In light of this oversight Linton investigated the relationship of musculoskeletal pain to the psychological work environment among 483 medical secretaries in a large Swedish general hospital. He found that a 'poorly' experienced psychological work environment (relative to an environment that was experienced as 'good') was related to greater frequency of neck and shoulder pain. The relative risk for frequent neck pain was 2.85 (95% CI = 1.28 - 6.32) and frequent shoulder pain was 3.32 (95% CI = 1.53 - 7.23). Moreover the subindexes of work content and social support were also found to be related to pain reports. Interestingly, no clear relationship was found between work demands and pain complaint. He concludes the results exploring further the relationship of psychosocial factors in the workplace and their relationship to pain complaints is a worthwhile endeavour.

Linton (1991) explored the manager's role in the successful return to work of the back injured employee. Linton (based on the work of Wood, 1987 in Linton, 1991) notes that immediate supervisors seem to play an important role in the return to work for back injured personnel since they have responsibility for these employees, and they have unique knowledge of the workplace, the situation and the individual involved. Linton solicited the participation of supervisors from the nursing staff of the Orebro Medical Center. From this pool, 47 female supervisors who had employees either currently undergoing treatment for back pain, or were candidates for such treatment, were enroled in a one day educational program. The one day program offered information on back pain and emphasized specific behaviours that the supervisors could use to help their employees successfully return to work. The result showed that the course was well received by the supervisors as 78% of them would recommend the course to a colleague. Furthermore, the returning employees gave their supervisors significantly higher ratings of support than a control group of supervisors who had not received the program. Linton concluded that educational programs that target specific behaviours of the supervisors of employees who suffer back problems may be effective in promoting successful return to work for these employees.

Immediate supervisors may be essential in establishing successful preventive and return-to-work measures for employees suffering neck and back musculoskeletal pain. Linton (1991) explored the role of training immediate supervisors in the reduction of the number of musculoskeletal neck and back injuries among railroad workers. One group of 22 supervisors who received instruction in how to deal with musculoskeletal injuries were compared another group 14 of supervisors who did not receive any such training. In total the 36 male supervisors and 171 male employees of the Swedish railroad system completed the program and answered questionnaires before and after the program. The results showed that the training program was well received among the supervisors and substantial changes in their knowledge of musculoskeletal pain and their behaviours and attitudes toward those who suffer such pain occurred. The trained group showed significantly more target behaviours consistent with the course content than the untrained controls. In addition the employees of supervisors who received instruction reported significantly more target behaviours were used by their supervisors than the employees of supervisors who did not receive instruction. Linton concluded that training of supervisors can result in changes in attitudes and behaviours. Thus this is a fruitful avenue to pursue in the prevention of, and rehabilitation from, musculoskeletal pain among employees.

Linton (1992) in an examination of a secondary prevention program for recent onset back pain studied 36 females with back pain to determine factors that either help or hinder recovery. In an 18 month follow up patients were assessed on pain intensity, fatigue, anxiety, sleep, activities of daily living, depression, helplessness, medication, and sick-absenteeism. Results indicated that patients had significantly less pain, used fewer medications, and were more active at 18 month follow-up than at baseline. With respect to return-to-work, all subject had returned and 1/3 reported no pain-related work absence during the 18 month follow-up. Interesting findings occurred with respect to hinderance factors. The strongest hinderance factors emerged from the psychosocial environments of the workplace. Despite patients reporting difficulties in making ergonomical adjustments, the most difficulties stemmed from things as "stress, uneven workloads, and problems obtaining adequate help from other personnel" (Linton,1992).

Of considerable interest was the role of supervisors in the return-to-work program. The response of supervisors (or lack thereof) appeared to be a strong negative factor in return-to-work success. For example, "... participants report that their immediate supervisors often did not even acknowledge that they had been off work 5 weeks to participate in a secondary prevention program" (Linton, 1992). Participants did not feel they received sufficient support from supervisors in their efforts to return to work. Linton concluded that the secondary prevention program was effective and future programs should devote considerable attention to the role of supervisors and other psychosocial factors or the work environment to ensure their is support for the worker in their return-to-work efforts.

Linton (1986) in a extensive review of the literature to date appraised various methods for the management of chronic pain. In this article several types of behavioral remediation approaches are assessed including, operant conditioning, biofeedback, relaxation and cognitive methods. Linton feels that there is evidence to support the efficacy of some behavioral techniques, but the method used needs to be tailored to the patient and the situation. Operant conditioning according to Linton is useful for increasing activity and reducing medication use, but shows little effectiveness in the reduction of pain behaviours and pain self reports. Relaxation and biofeedback methods were compared. Linton concluded that relaxation training is effective in treating certain aspects of chronic pain (pain and tension decreases). Biofeedback on the other hand in Linton's assessment fails to provide "convincing let alone conclusive evidence or its utility." Cognitive strategies do not fair any better than biofeedback in Lintons review, as he concludes that "... there is virtually no evidence that empirically demonstrates..." the effectiveness of cognitive methods. In summary Linton states that the treatment method chosen by the clinician should match the patients needs. If the goal is to reduce pain self reports than relaxation methods may be used. If the goal is to reduce medications and increase activity, then he recommends operant techniques.

In a later study of patients with chronic pain, one group with musculoskeletal pain, and the other group with chronic pain but without musculoskeletal problems, showed some differences with early intervention (Linton, 1993). For those with a history of musculoskeletal pain, there was little difference between those who had early intervention and those who had the usual treatment of their problem, although both showed some improvement. For that group with chronic pain but without musculoskeletal problems, early intervention did result in significantly less sick listing. More importantly, patients who had chronic pain but without musculoskeletal problems, and who had early intervention were 8 times less likely to become chronic pain patients. He concluded that early intervention did not reduce pain post-treatment in some groups, but it was useful in reducing absenteeism and in preventing chronicity of pain.

Working with Pain

There is increased evidence that continuing to work despite pain, when nerve compression and other local pathology is not evident, is not harmful, is probably helpful, and avoids a lot of the long term problems with chronic pain and psychosocial change. This requires a marked shift in the attitude that most, including physicians, have towards chronic pain.

The Quebec Task Force on Spinal Disorders (Spitzer et al, 1987) clearly stated that the best treatment of chronic low back pain without radiation or objective clinical signs was work. In a later editorial, Spitzer (1993) expressed concern that the report has been "without honor in its own land". He felt there had been little movement to implement any clinical or organizational recommendations of the Task Force, and stated "It is generally acknowledged that this is largely because of strong opposition by organized labor. The unions never liked the key conclusion of the report."

"The Task Force found that working with pain hurts but does not harm and that failing to return to work because of pain promotes a great deal of harm. A doctors typical approach at the time to prescribe bed rest for up to 2 weeks with concurrent sick leave certificates (often renewed more than once) has not changed much. And yet that approach to treatment is probably the main determinent of real harm in disorders of the vertebral column - namely chronicity." There were many recommendations and observations in the Quebec Task Force, but Spitzer identifies 5 that should be be retained and acted upon:

1) Workers with symptoms of low back pain, particularly first time casualties, should be strongly urged to return to work almost immediately if there are no objective signs found by the clinician who only needs a good history and physical examination to classify the type of problem and decide on its management.

2) Pain alone is an insufficient cause to delay resumption of work.

3) The few patients failing to respond to conservative management should be followed up progressively with standardized diagnostic packages and forceful treatment programs that minimize absenteeism.

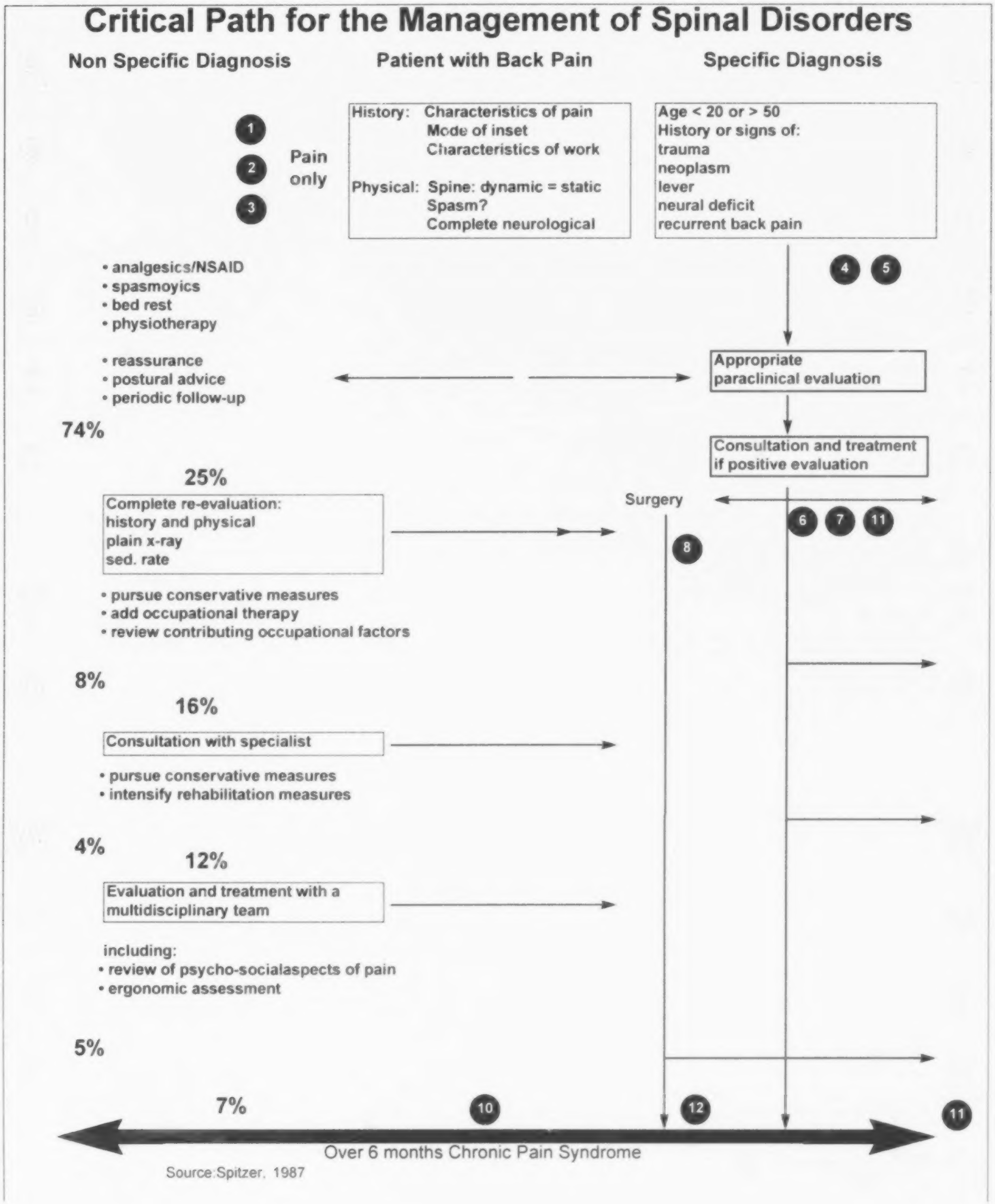
4) Our current health system and employers' attitudes, encourage a drift towards 6 months of sick leave for workers with stubborn low back pain should have its strategies radically altered to prevent chronicity.

5) Almost everything we do as clinicians for patients with low back pain needs to be evaluated, or to be re-evaluated, or confirmed with well designed and properly executed randomized control trials or observational non-experimental studies. The study subjects should be patients and the priority outcome should be return to work.

He concludes, "The hurt of low back pain is not necessarily harmful; chronicity is harmful and can be devastating to the workers, and/or their families."

Some Strategies for the Management of Chronic Pain

The following are some brief comments on various strategies used in the assessment, care and rehabilitation of patients with chronic pain. Our specific recommentations, however, are listed in the next section, under the title Recommendations.



Critical Path for the Management of Spinal Disorders

Non Specific Diagnosis
Patient with Back Pain
Specific Diagnosis
1
2
3
Pain only
History: Characteristics of pain
Mode of inset
Characteristics of work
Physical: Spine: dynamic = static
Spasm?
Complete neurological
Age < 20 or > 50
History or signs of:
trauma
neoplasm
lever
neural deficit
recurrent back pain
4
5
• analgesics/NSAID
• spasmoyics
• bed rest
• physiotherapy
• reassurance
• postural advice
• periodic follow-up
Appropriate paraclinical evaluation
74%
Consultation and treatment if positive evaluation
25%
Complete re-evaluation:
history and physical
plain x-ray
sed. rate
Surgery
6
7
11
8
• pursue conservative measures
• add occupational therapy
• review contributing occupational factors
8%
16%
Consultation with specialist
• pursue conservative measures
• intensify rehabilitation measures
4%
12%
Evaluation and treatment with a multidisciplinary team
including:
• review of psycho-socialaspects of pain
• ergonomic assessment
5%
7%
10
12
11
Over 6 months Chronic Pain Syndrome

Source:Spitzer, 1987

Ideal Management of Chronic Pain Syndrome

MEDICAL MODEL	FUNCTIONAL MODEL	CASE RESOLUTION
IMPAIRMENT	**DISABILITY AND HANDICAP**	
A) Investigation	A) Physical	A) Personal
B) Diagnosis	B) Psychological	B) Workers' Compensation Board
CURE	**FUNCTION**	**GET ON WITH LIFE**

Clifford JC (1993). Successful Management of Chronic Pain Syndrome. Can Fam Phys; 39:549-559

Assessment: Patients must have a careful assessment to look for underlying treatable pathology and to gain an understanding of the problem and all its complexities. This gives confidence in the therapeutic setting to not only the physician but also to the patient, who may only fully cooperate with management when they feel that a careful evaluation has been done with the appropriate investigations and examinations.

Educate and Inform the Patient: It is helpful to sensitively explain to patients the complexity of pain and how different factors can modify pain and how it persists. They should learn how different approaches, attitudes and coping mechanisms may modify how pain is managed. It is particularly important to differentiate the concept of acute pain and injury from that of chronic pain. Put in careful terms, most patients will understand this. Acceptance is another thing, however, and many patients have a predetermined concept about pain and about their problem, and they easily reject other solutions. As a result, this must be handled sensitively, and with that in mind. It is also important to address disbelief, rejection and conflict when that arises. Patients and their families need to understand that a cure may be unlikely, and the measure of success in therapy is improved function, even if pain continues, that we expect improvement, not cure, and that a return to work with pain is a positive goal.

Too often the health care professionals take over the management of patients and leave them passive in the process. Patients must take an active role in their recovery, and require information and reassurance to do this. Families can both assist or impede the therapy in patients, and education would assist them in taking a positive role.

Different Perspective for the Physician and the Patient: The physician must recognize that this is not a situation where a new test, a new treatment or a "magic bullet" is going to suddenly resolve the problem when other attempts have been unsuccessful. The physician must shift from a concept of healer to that of a rehabilitation manager, taking into account the situation, the person, their social setting and environment. The patient must also recognize that this is not a simple pain disorder awaiting a miracle solution missed by others.

Early Intervention: It has been noted in repeated studies that the liklihood of returning to work and an active, productive life, decreases as time goes on. This is the best argument for early intervention. By the time the patients become a chronic pain patient long after the normal healing time, they are already far along in a course of the disease, and have developed many psychosocial, emotional and behavioral aspects of chronic pain that impair the liklihood of a good outcome.

Return To Work Despite Symptoms: It should be emphasized and discussed early that a return to work is possible, despite a continuation of symptoms and pain. Often, the continuation of pain gives patients and families the message that it is too early to consider a return to work. In chronic pain, patients can often begin to increase activity and return to work despite the pain, even though this may mean some modification of the job, or retraining for a different position.

Early Return to Work: One of the most beneficial aspects of treating chronic pain is to have the patient return to work early, despite pain. If they can overcome the anxiety of the presence of pain, and can gain some assurance that they are not hurting themselves and worsening their condition, they can often manage employment, even if is modified or partial, and they gain a sense of self confidence and a reward for improving function.

> "Early return to work (or no loss of work) is often the most essential part of treatment for delayed recovery. It frequently is also the most painful part of the treatment, and, just as the physician expects to hear protests from a child who has been told he must have a painful injection, the physician should anticipate protests from this patient and should stand firm, just as he would when he urges painful but necessary treatment for other medical problems."
>
> **Derebery and Tullis, 1983**

The above authors note that work provides self esteem, social contact and community acceptance. It reduces aspects of secondary gain and "malignant boredom". It also prevents the physiological weakening associated with inactivity and psychologically the patient recognizes that the problem is temporary and not a permanent disability. To have a successful return to work requires some education and support from the physician, an attitude change in the patient, and adaptation and understanding in the workplace. Patients should understand that they can expect to have some increase in pain and fatigue but that is normal and will later subside (Derebery and Tullis, 1983).

Disability from work relates to the job demands, conditions of the work and the employer. The employer looks at the ability of the worker to perform a task, but also the risk of further loss or liability from accepting back an injured worker. As outlined by Chaplin, employability also includes such aspects as medical status, capacity to perform, capacity to travel to and from work, and the capacity to be at work. He notes that if the injured worker can get to and from therapy, he can probably get to and from work. Most injured workers can do some kind of work, although it may not be their original job, or at the performance levels prior to injury. Assessment then comes down to what the person is capable of, the cost to the employer, and the risk to the employer. The employer can pay the person to do some kind of work, or pay the person not to work at all.

Work Hardening Concepts (Callahan, 1992): Work hardening programs have some success in returning people to work, as they progressively increase the person's capacity and confidence in handling their job. Perhaps the most effective setting for work hardening concepts is in the actual job site, adjusting the work and demands to a progressive increasing level. This requires some acceptance and support by employers and fellow workers but has the promise of greater success, particularly since it adds the assurance that their job is secure.

Work hardening is defined as "a highly structured, goal-oriented, individualized treatment program". "Work hardening focuses on graded work stimulation and conditioning tasks to improve the biomechanical, neuromuscular, cardiovascular/metabolic and psychosocial functions of disabled workers. It provides an interdisciplinary bridge between acute care and the workplace by addressing issues of safety, productivity, physical tolerances and other behaviors related to work performance." (Scheer, 1990).

A work hardening service provides the injured worker with supervised, progressively graded simulated work tasks. It is usually under the direction of a physical and/or occupational therapist. It facilitates work return by helping the individual to develop critical physical capacities and worker traits.

Give the injured worker some sense of mastery over their pain: Nachemson (1994) and others have noted that patients with chronic pain often have attitudes that suggest that they have lost control over their lives, their circumstances and their pain.This leads to frustration, anger, fear and the adoption of the “sick role”.

Early intervention, stressing concern for the worker, but emphasizing early return to function and work despite pain, and early reassurance that the job, even if modified, will still be present, goes a long way to reduce the sense of insecurity and helplessness that patients with chronic pain often develop. One strategy is to have an early intervention case worker who meets early with the injured worker and provides some of the support and reassurance. Again I emphasize that it is far too late to begin to intervene many months or even years into the process.

Sofaer and Walker (1994) studied 40 (20 male and 20 female) patients attending 2 pain clinics in southern England, to assess their mood and other psychological variables in an attempt to find predictors of negative mood among chronic pain patients. The most common negative moods were tenseness, worry and irritability. The variable with the highest correlation with chronic pain was lack of information about pain, and was thus chosen as the best predictor of negative mood. Other variables showing association with negative mood were lack of sleep, lack of occupation, lack of emotional support and financial problems.

From these finds Safaer and Walker concluded that since lack of information about pain was the strongest predictor of negative mood among chronic pain patients, this could be easily remedied with proper counselling and management by the physician. “In situation where no diagnosis can be offered, the importance of discussing this with the patient cannot be underestimated”. It would be advisable for Workers’ Compensation to provide educational materials related to chronic pain. Because the concepts are new for many people, the ideas and concepts would be important to reassure the patients about steps taken to improve their symptoms and have them return to active lives and employment.

The sense of helplessness over pain can be allayed by clear explanation that the investigations and assessments have provided assurance that no serious underlying pathology is present.They need to be assured that increased activity and function will get them back to good health and employment faster, even though they have pain.They can be shown strategies for reducing discomfort, and strategies to continue to function while minimizing the pain. They need assurance that the object is to get back to normal function, not to cure the pain at this point.

Emphasis on function, not pain: An important principle in the management of patients with chronic pain is to keep the therapeutic and management goal on improved function, minimizing the attention to pain. Patients naturally concentrate on the pain and therefore reduce function, and continue to minimize function if pain recurs on activity. They must be assured that this is natural, but the object is to improve function and eventually to reduce and manage pain.

Emphasis on improvement, not cure: There is often a spoken or unspoken request to take away pain. It should be emphasized that the object is to improve function, reduce pain, but not initially to cure the problem. Emphasis on a cure is frustrating, and leads to many problems with overuse of drugs, investigations, consultation and enforced disability.

Attention to job satisfaction: Nachemson (1994) indicated that the single most important underlying factor in the problem of long term disabling low back pain was job dissatisfaction. After decades of studying ergonomics to explain low back injury and persistent chronic pain, he concluded that one motion had a relationship, lifting and twisting at the same time, but a far more important issue was job dissatisfaction. He pointed out that pilots, enthusiastic about their job and about flying, often had spinal fractures from being ejected from their planes at 10 times the force of their body weight. Although they had x-ray changes indicating significant low back injury, all of them were back to work and flying in one month, and 5 years later none were disabled.

Clearly, this is an important concept in prevention of chronic pain and disability. There are ways to improve job satisfaction, but this is often taken for granted until a problem or issue arrises.

Assess aspects of their lives, relationships and work satisfaction: Although it may initially seem like a huge step to try and address problems in a person's life, when managing their neck, back or wide-spread pain, but steps may often be taken, and just understanding the relationship of these issues may help the person comes to terms with these and take decisions and deal with them more effectively.

Withdrawal of Drugs: One of the most important steps in the management of chronic pain is to begin to withdraw the sedatives, hypnotics, narcotics and other drugs that camoflage, complicate but do not help the problem. It is also important to recognize that one of the most common offending drugs in this situation is excess use of alcohol. Patients will understand that the drugs are not helpful, so it is important to explain that these are often useful in acute pain, but are not useful and may be harmful in chronic pain. Many chronic pain patients are taking far too many drugs, even though they themselves admit that the drugs are not helping. Patients often develop dependence on drugs, particiularly analgesics, narcotics, tranquilizers and anti-depressants. We thus have the paradoxical situation that the treatment is making the patient worse because of added dependence and side effects, but is not helping the goals of symptom control and a return to normal function.

Withdrawal of drugs is best done by a regular schedule, after explanation, with ongoing support and explanation over the few weeks of the process. They should understand that there is discomfort to go through to achieve better health. Patients often believe that increased discomfort when they come off the medication, due to withdrawal symptoms, emphasizes the need for the drug. This often occurs when patients are on sedative and narcotics. Even though they are not helping their problem, withdrawal increases their symptoms and discomfort so they wish to continue or even increase them. This requires explanation, understanding and support. But with this, patients can be taken off the ineffective drugs. Occasionally a more structured program is required in a detox centre.

Physician Education: Most authors on chronic pain have noted the deficiencies in physician education regarding chronic pain. Medical education concentrates on the concepts of acute pain, and physicians are skilled in the medical model of management, which is not appropriate for chronic pain. Management of chronic pain requires a restorative and rehabilitative approach.

Train Doctors for WCB Certificates: For appropriate management of patients on disability due to chronic pain, their physicians should have a background and understanding of the concepts of chronic pain, rehabilitation, job modification and retraining, compensation and legal regulations. It would not be inappropriate to have physicians who manage such complex patients to be encouraged or required to have continuing education regarding these approaches. When a physician has attained appropriate training they could be issued a certificate, assuring that they understand the nature of these conditions and the assessment and regulations regarding compensation.

Multidisciplinary Approach: Repeated studies have demonstrated that a multidisciplinary approach to chronic pain obtains the best results for management of symptoms and return to employment. Although different philosophies and concepts may be used, these multidisciplinary units regularly obtain greater success than usual approach to treatment and management by individual physicians and consultants.

Weir and colleagues in Hamilton, Ontario, studied the profile of users of specialty pain clinic services and found they generated proportionately less costs in the use of other health services when they were compared to non-users (Weir et al, 1992).

One model of a multidisciplinary treatment program within a Workers' Compensation setting was described in British Columbia (Marchioli et al, 1987) They describe a unique program called Back Evaluation and Education Program (BEEP). Despite indications that return to work after one year of time loss may be in the range of 4%, their results of return to work after at least one and a half years of time loss in the BEEP program was approximately 60% in the first 246 patients treated over a 3 1/2 year program. In addition, between 60 and 70% of patients reported a reduction in pain.

Flor et al (1992) carried out a metaanalysis of 65 studies on the effective of multidisciplinary treatments on chronic back pain and concluded that multidisciplinary treatments are superior to the published reports on no treatment, waiting lists, and single discipline treatments such as medical treatment or physical therapy. These effects were stable over time. The beneficial effects were not limited to only pain, mood and interference, but also extended to behavioral variables such as return to work and the use of the health care system. Unfortunately, many studies on chronic pain, and on multidisciplinary treatments, are of variable quality, and the authors requested improvement in research designs of published studies and this would extend to all projects in reporting treatment results in chronic pain.

Fishbain et al (1993) did an even more extensive study of multidisciplinary pain centre treatments, assessing the prediction of return to the workplace, metaanalysis of these studies showed that many did not fulfill careful criteria that would allow consistent determination of the factors that predicted return to work. They concluded that it was unclear which variables or sets of variables predict return to the workplace after multidisciplinary pain centre treatment, but indicated that such studies may be neglecting the workplace as an important factor in the return to work results, as suggested by the Dworkin (1985).

Compensation: Many who examine the problems of managing chronic pain have called for simplified compensation methods and tort reform, to have cases settled early so that ongoing confrontation, with compensation as a focus, is put behind. Simplified methods of dealing with chronic pain patients would assist in the treatments and lead to a better outcome.

Assess if the Patient is Ready to Get Well: As Chaplin points out, (1991) many chronic pain patients are ready to give up their illness role but need a socially acceptable vehicle for "getting well". Some are unsure if they want to change. Some wish to change but are not willing to make the commitment required to accomplish the change, or to take the risk that is involved. Some will only change when the circumstances become so disrupted and unhappy that it creates suffering of its own, or that the rewards and socially acceptable support systems begin to disappear.

Assess Hidden Messages: Patients may have a lot of strong beliefs and feelings in relation to their pain, and many of these may be unspoken. The patient may fear an underlying tumor. They may believe that the myelogram caused all the problem. They may believe that the surgeon botched their operation. They may hate their boss and receive no reward or satisfaction from their job.

Rewards for Healing: As Fordyce has pointed out, (1988) much of the current system, and most of medical management provides rewards for illness complaints and maintaining the sick role. Patients should be encouraged and rewarded for signs of improvement, increased healthy activity and decreased complaint. This requires a major re-education of health care providers and families.

Chronic Pain Management Program Contract: Contracts have been used in many therapeutic situations, and they essentially provide an agreement between the patient and the physician for how they will act and proceed. This also allows the patient to take some control over their own problems and to commit to healthy behavior (King and Kelleher, 1991).

Although it has to be addressed in a very specific manner with each patient, a contract to accept certain goals and expectations should be agreed upon by the patient and the therapist. Activities focus on active therapy and participation, not on passive activity. The contract should not be open ended and vague, but have very specific goals and measures. This is important for the therapist as well as the patient. It is also a way of minimizing pain games (King and Kelleher, 1991). Contracts are also valuable in focussing the multidisciplinary team and the patient on the goals, objectives and responsibilities of the various participants in the therapy.

Commit to Actions, Accept the Results: Chaplin says we must learn to distinguish between actions and the results they produce. We should focus on specific actions and accept the results. Contracts should specifically relate to activity, exercises, drugs, nutrition and participation in therapeutic programs. I have also found it helpful to relate to things such as the patient's attitude and expressions of pain, and their method of relating to and conversing with family and friends.

The results of a multi-disciplinary therapeutic approach such as the Waukesha Memorial Hospital in Akron, Ohio (Tyre, 1994) showed good results with a long term (4 years) rate of return to work of 86% and minimal use of narcotics in 33 patients studied. Treatment modalities included relaxation techniques, exercise, body mechanics, pacing, distraction TENS, non-narcotic analgesics, and occasionally narcotic analgesics.

Public Sessions: Publication education programs regarding management of pain, back care, stress management and many other healthy processes would be beneficial and preventive. Although most people who attend such sessions are doing so because they have already developed a problem, it allows them to take some control over their situation.

Do Not Overdo Rest: Our grandmothers were often correct and wise in their approaches to the management of common ills and complaints. One widely held belief, however, has more negative than positive results, particularly when it is overused, and that is the treatment by rest. Rest is a natural response to an injured area. An injured arm will be held and not used. Any painful area will usually be rested in the acute situation, until the healing has begun. But the general phenomenon of rest has been much overused therapeutically. Women were kept in bed for ten days after childbirth, myocardial infarctions were treated with bed rest and total inactivity for over two weeks. Major joints were immobilized for weeks and months after fractures, acute low back pain was often treated with long periods of bed rest and immobility, and general illness, pain and other complaints were often treated by prolonged periods of rest. When the person tried to mobilize, any reappearance of pain, dizziness, weakness or other symptoms reinforced the need for even more prolonged rest. As pointed out by Fordyce (1988), the admonition "Let pain be your guide" often compounded and complicated the treatment by beginning a vicious cycle. Every painful movement reaffirmed that healing had not occurred, and encouraged greater rest and disuse of muscles and joints, with an increased in discomfort, pain and other symptoms. Thus pain may persist and worsen despite adequate healing. Thus in all the circumstances mentioned above early mobilization has been shown to produce better outcomes, reduced symptoms and distress and avoidance of complications.

Linton (1985) explored the relationship of activity level and pain intensity in 30 chronic pain patients. Linton wished to probe the assumption that chronic pain patients should refrain from activities as a means of mediating their pain. The relationship of activity level to pain was assessed by several measures, including self report and more objective observation. Interesting discrepancies were found between self report, self monitoring, observed activity. The results showed that upon self report there is a significant relationship between activity level and pain as measured on a global interview question. As well patients with a lot of pain give lower assessments as to their ability to participate in daily activities. However these self evaluations seem to disappear when patients assess themselves with more scrutiny, as no correlation between pain intensity and actual activity level, as measured by self-monitoring, was found. A similar finding of no correlation between pain intensity self-report and activity level on a specific task (cycling) occurred. Linton (1985) concluded that the results correspond to the operant view of chronic pain, in that environmental contingencies effect verbal reports so that they may not necessarily be consistent with actual behaviour. In Linton's view, anxiety and fear about pain may have more of an impact on the avoidance of activities than an actual pain-activity relationship.

Patients often understand the experience and the wisdom of how injured athletes are managed.The injured athlete is shown how to control their weight, to improve strength, and to maintain their motor skills during recovery (Derebery and Tullis, 1983).The athlete is expected to take an active part in treatment, to participate in physical therapy and develop an exercise program during convalescence, and to attend games in which he or she is unable to play, and then begins to work out with the team and as soon as possible returns to active participation. This works very well for athletes and it works very well for workers.

Exercise: Moldofsky has some good preliminary evidence that aerobic fitness may ameliorate the effect of the alpha-EEG-NREM anomaly. In a comparison of sedentary versus physically fit (long distance runners) individuals, in which the alpha-EEG-NREM anomaly was induced, only the "sedentaries" developed fibromyalgia-like symptoms, whereas the fit individuals did not.

McCain (1989) indicated that there were not very many controlled studies of non-medicinal treatments for fibromyalgia, and the only two that seemed to have demonstrated benefit in such trials were cardiovascular fitness training and EMG-biofeedback training. In a study he did comparing a cardiovascular fitness training program (CFT) to a flexibility exercise program (FLEX), he demonstrated that the CFT improved cardiovascular fitness in 83% of patients (none in the FLEX group) and there was significant improvement in pain threshold measurements over tender points in the CFT group compared to the FLEX group. They speculated that CFT might exert its effect through activation of the endogenous opioid system, as thought to occur in long distance runners. In previous studies they had demonstrated a significantly smaller difference between peak and trough values for serum cortisol and ACTH in primary fibromyalgia (75% of cases) but found none in rheumatoid controls. They speculated that exercise may also increase the ACTH and serum cortisol levels in fibromyalgia, normalizing the pituitary-adrenocorticol axis, and normalizing mechanisms of pain control.

One of the few substantiated treatments that improve patients with chronic pain has been cardiovascular fitness programs. They have the additional positive aspect of improving the patient's sense of confidence and recognition that increased activity is beneficial and not harmful. It also emphasizes to family and friends that overprotection is not necessary, and that the patients are capable and benfitted from increased activity.

Psychological Treatment: There is some evidence in the literature for better results with pshcyological and behavioral treatment of chronic pain, and these approaches have been reviewed by Benjamin (1989). He noted that a review of the various psychological approaches leads to the conclusion that in general there is good evidence for their efficacy despite the limitations on many of the research reports. The literature is also complicated by the isolation of the technique, since it probably functions best within a multidisciplinary approach which combines it with other forms of treatment. Research on this type of approach is much more complicated, but necessary.

The behavioral management of chronic pain was reviewed by Linton (1992) and he concluded that operant and relaxation methods have been shown in several control studies to be effective in increasing activity levels, decreasing medication consumption, and pain intensity ratings. Other benefits were decreased depression, improved sleep, decreased anxiety and so on. However, he also noted that the management of chronic pain problems seldom returns the patient to pre-pain levels of functioning and that management methods were time consuming and expensive. The answere lay in prevention of chronic pain.

EMG-Biofeedback: Biofeedback has been widely used in the treatment of various pain syndromes for the last 25 years. The results have been variable, but most show there is some improvement, usually in the range of 50 percent. The various studies and reviews of this therapy have been reviewed by Jessup and Gallegos. They outlined the published information in various pain syndromes but conclude that, although there is evidence that biofeedback and relaxation training are useful treatment interventions, much of the research and the published studies are of limited usefulness are they are so poorly designed.

Ferraccioli in 1987 reported a control study of EMG biofeedback in 15 patients during 15 sessions over a 5 week period. Nine patients had improvement in the number of tender points and pain intensity and morning stiffness, and the improvement persisted up to 6 months following the last treatment. This initial study was an open trial but a follow-up study randomizing patients to biofeedback and sham biofeedback again showed significant improvement with biofeedback. EMG-biofeedback has been beneficial, particularly in the short term. It may be most useful in giving patients a sense that treatment can give them improvement, and that they can take some control over the management of their pain. Long term results have been variable, but success seems to be determined by the patient's ability to take over the techniques learned by the use of technology.

Hot Baths: Because the patients have wide spread pain and muscle spasm, hot baths are beneficial in producing total body relaxation. They are simple and cheap, and can be easily added to other treatment regimes.

Relaxation methods (meditation, self-hypnosis, autogenics, relaxation exercises): Huub et al (1991) randomized 40 patients with reactive fibromyalgia to 1 of 2 treatments: Hypnotherapy or physical therapy. Patients were assessed on several criteria at 12 week and 24 week follow-ups. Patients on hypnotherapy showed significantly better improvement on: pain experience, fatigue on awakening, sleep pattern and global assessment at 12 and 24 weeks than those of physical therapy. However. Huub et al. caution that the patients on hypnotherapy improved on subjective measures not on more objective one (e.g. # of tender points). They conclude that hypnotherapy may be helpful and helping fibromyalgia patients cope with their condition, despite the persistence of the underlying condition.

Spa therapy was effective in improving the symptoms, disability and drug use in patients with low back pain. Longer term evaluation showed improvement in all measure accept disability status (Guillemin et al, 1994).

Antidepressants and Analgesics: Jaeschke et al (1991) and Zitman et al (1990) conducted separate randomized controlled trials on amitriptyline in patients with fibromyalgia and chronic pain, and obtained modest improvement. Better results were obtained in a placebo controlled trial of amitriptyline, psychotherapy and placebo in various combinations, and found that the best results were amitriptyline plus psychotherapy (Pilowski and Barrow, 1990).

Russell et al (1991) conducted a randomized control study of ibuprofen and alprazolam in patients with fibromyalgia and obtained positive results in the combined treatment group. However, these results also are modest at best.

Carette et al (1994) carried out a randomized, double blind, placebo controlled trial of amitriptyline and cyclobenzaprine which showed 21% improvement at 1 month on amitriptyline and 12% on cyclobenzaprine, and no improvement on placebo. However, at 6 months there was no significant difference between any of the groups.

Wilson (1990) in Ottawa found some modest effect using flurbiprofen in chronic pain, but on Onghena et al (1993) found no pain relief in a placebo controlled, double blind crossover trial of minanserine (Onghena et all, 1993).

All of this emphasizes the disappointing results of attempting to treat chronic pain of any for with antidepressants and/or analgesics. Perhaps the only positive conclusion would be that amitriptyline combined with other approaches to therapy may be a useful adjunct.

Goldenberg has reviewed the treatment of fibromyalgia in two excellent reviews (Goldenberg 1989A, Goldenberg 1989B). He reported that when 87 fibromyalgia patients were asked to rank therapies he found that there was no difference between medications and non-pharmacologic treatment, and that patients that usually tried many forms of therapy and none seemed to be very effective. Essentially the same results were found in a study of 81 patients by Cathey and Wolfe (1986) and they found that patients had used an average of 4.7 drugs during the year of study and were taking 3.8 medications at the end of the year.

Trigger Point Management: Various methods have been directed at decreasing the pain and tenderness associated with tender points and trigger points. Although each of the methods have their enthusiasts, all tend to get some short term results. Procedures include message, accupressure, accupuncture, cold, heat, injection of local anesthetics with or without steroids, TENS, diathermy, ethylcloride spray, stretching, and many other procedures. Many give initial relief, but none are very effective in the long term. As a form of therapy they are a useful adjunct, however, because the patient is often distressed by the immediate pain, and such procedures as message, ice, stretching and gentle neck exercises are often ways the person can take control over some of the symptoms, and learn something about the focus of their pain. The management of trigger points was reviewed by Rachlin (1994).

Manipulation: This is essentially an abrupt passive movement of the vertebrae beyond their physiological range but within the anatomical range. Verbetral manipulation has been studied in a number of controlled trials and a few have shown temporary relief of pain compared to other methods of treatment, but none has shown a reduction in the duration of work absences (Spitzer, 1987).

Acupuncture: The longer term usefulness of acupuncture has not been scientifically validated (Spitzer, 1978) but the results seem to indicate that it can lessen pain in a cumulative manner during a series of treatments. Although there are a number of studies that point out that acupuncture can reduce chronic pain, there is no scientific study demonstrating the superiority of acupuncture over other treatment modalities.

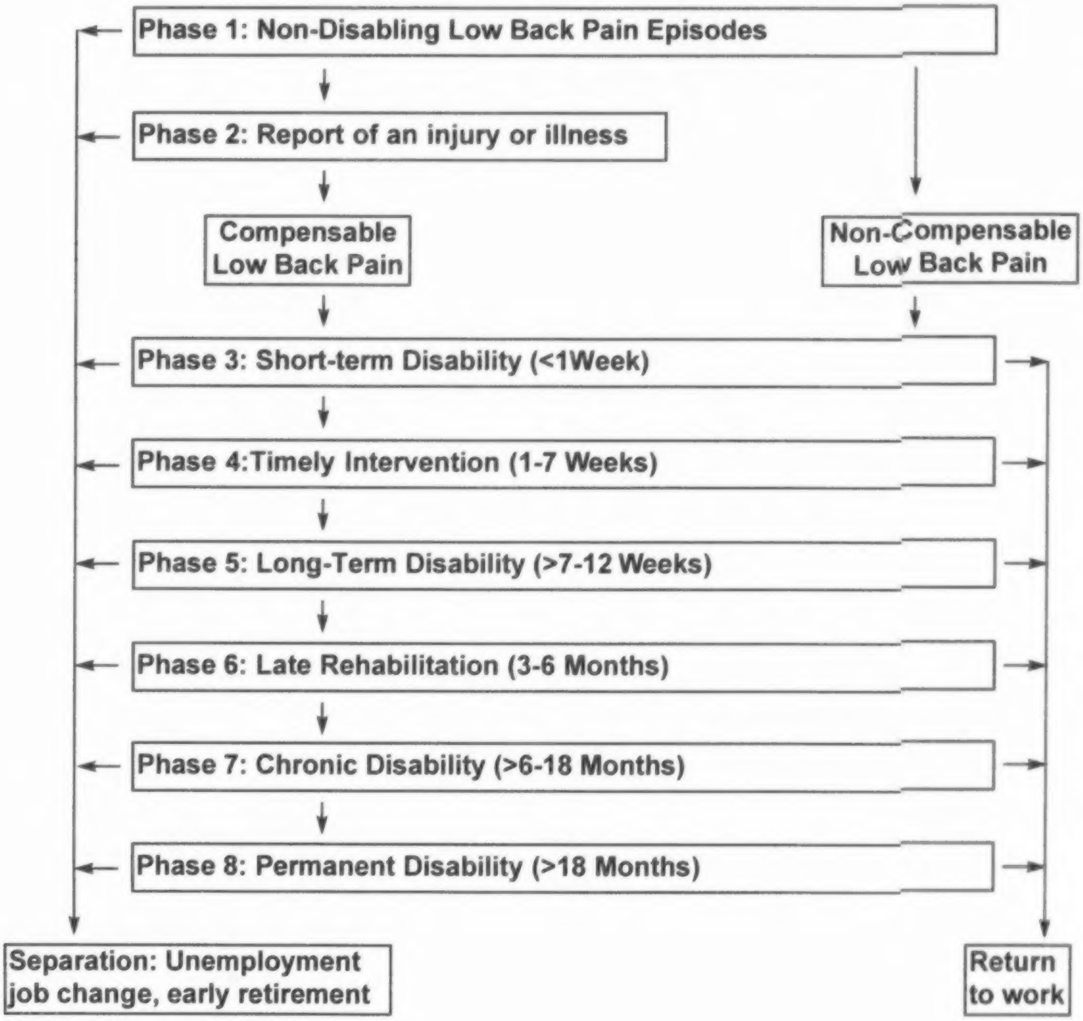
Fads: Chronic pain has always been a fertile area for fad treatments over many centuries. This is not to suggest that alternate forms of therapy do not have something to offer, or that practices carried out by traditional medicine don't fall into the area of "fads" but that our current inadequate approaches to management encourages alternative approaches and sometimes dramatic, illogical and even fraudulent therapies.

As I indicated, traditional medicine is not free of ineffective therapies as we have seen over the years enthusiasm for procedures such as coccygectomy, and Chymopapain injections for low back pain that have now fallen into disfavor. There is even a longer history for enforced bedrest and immobility as a treatment of chronic pain that is now known to be deleterioius. The most recent popular treatment to fall into disfavor is the corticosteroid injection into facet joints (Carette, 1991). Often enthusiasm for a therapy is based on the current thinking about the origin of the disorder, and when the paradigm shifts, those therapies fall out of favor and new ones enter. The current challenge is to have clear cut double blind controlled studies to evaluate the effectiveness of such therapies before they become widely used.

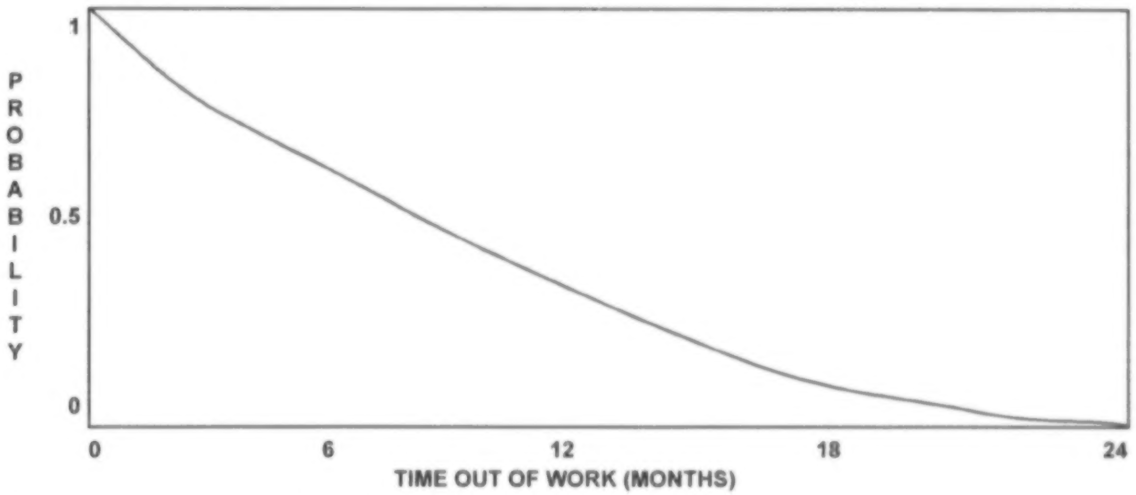
In a review of fads in the area of low back pain, Deyo (1991) cautioned that "Too much research on back problems consist of case series that serve the entrepreneurial purposes of legitimizing expensive new forms of technology, rehabilitation centres, or surgical programs of uncertain effectivenss. Although the entrepreneurial spirit is essential for innovation, it is less well suited to the impartial evaluation of that innovation."

Other Treatments: Other treatments that might be helpful due to altering the gait mechanism for pain at the spinal cord include ice, heat (ultrasound), interferential current stimulation, cold (helium-neon) laser, or TENS, but these have not been subjected to well designed double-blind control studies. Cognitive behaviorial therapy, hypnosis and relaxation training might act through more centrally originating pain inhibitory pathways. McCain concludes however, that is more likely that any successful modality will act by altering the pain transmission system at multiple levels. Currently, because well designed controlled studies of treatment in chronic pain and fibromyalgia are few, many forms of therapy are used, often in a haphazard fashion.

Phase Model of Occupational Disability Due to Low Back Pain


Phase 1: Non-Disabling Low Back Pain Episodes
Phase 2: Report of an injury or illness
Compensable Low Back Pain
Non-Compensable Low Back Pain
Phase 3: Short-term Disability (<1Week)
Phase 4:Timely Intervention (1-7 Weeks)
Phase 5: Long-Term Disability (>7-12 Weeks)
Phase 6: Late Rehabilitation (3-6 Months)
Phase 7: Chronic Disability (>6-18 Months)
Phase 8: Permanent Disability (>18 Months)
Separation: Unemployment job change, early retirement
Return to work

Source: Krause and Ragland, 1994.



Chance of Return to Work:The Probability of Recovering from Disabling Low Back Pain

Source: Beals RK, Hickman NW. (1972) Industrial injuries of the back and extremities. Comprehensive evaluation - an aid in prognosis and treatment: A study of one hundred and eighty patients. Am J Bone Joint Surg; 54:1593. In rause and Ragland, 1994.

Prognosis

Crook and Moldofsky (1994) studied 150 randomly selected workers who had not returned to work in 3 months following musculoskeletal strain or sprain injury. They then looked at prognostic indicators for return to work. The relative rate of return to work for females was 1/3 less than males, and 20% less for every 10 years increase in age. Functional disability and psychological distress associated with symptoms were significantly and negatively associated with the rate of returning to work. The employers provision of a less physically demanding job or shorter work hours was positively associated with return to work rates. There were gender differences in the prognostic variables predictive of the total number of days on work disability. Age, environmental work stressors and physical independence handicap, were more important factors in explaining work disability for male workers. The total number of painful sites and the psychological distress associated with symptoms were important prognostic factors for female workers.

As noted by King (King and Goddard, 1994) the greatest impediment to vocational reintegration is inadequate motivation. On the other hand, factors associated with a better return to work include:

- shorter time out of work before rehabilitation
- satisfying job
- better educated patient
- good work history
- younger patient
- less or no compensation benefits
- no pending litigation
- no substance abuse or self destructive behaviors
- fewer psychotrophic medications
- fewer operations
- primary/secondary/tertiary gain factors not remaining operative in perpetuating pain
- a more "return-to-work" directive approach in therapy

The objective is to reduce pain, and get the person back to normal function, despite any continuing discomfort. This requires a reorientation of the goals of therapy for many patients and physicians. In terms of rehabilitation, successful treatment of chronic pain syndrome means eliminating disability and handicap. Increased function that allows return to full employment can be done even without resolution of the pain itself. Optimal self management and decreased dependence on the medical care system can be measured by the elimination of narcotics and tranquilizing medications and a decrease in the utilization of health care. As King noted, suffering is often decreased, and although desirable, a decrease in pain is not essential to accomplishing the goals of rehabilitation.

Explain to the patient that we recognize their discomfort and that we don't hold them responsible for the illness but they are clearly held responsible for recovery

Goldenberg (1989A, 1989B) suggests that the cornerstone of a treatment plan should be discussion with the patient and the family. They then should be instructed to stop seeing multiple physicians and undergoing multiple tests. Discussion about exercise, posture, recreation, the workplace and stress are important. For many patients no other therapy is necessary other than a simple analgesic. If they continue to be symptomatic, especially if sleep disturbance is a problem, a tricyclic medication should be given (10mg of amitriptyline at bedtime, gradually increasing to 20-35 mg). Relaxation, heat or message or sprays or injections of local anesthetic agents, biofeedback and exercise programs can be tailored to the individual. He concludes "Much more needs to be learned about the source of pain and fatigue in fibromyalgia before we develop highly effective treatment. In the meantime, a compassionate and understanding attitude is our best approach".

Goldenberg indicates that the prognosis is not good. In a longitudinal survey over three years only 5% of patients had complete remission, and 60% had moderate to severe pain and fatigue. They admit that their patients are in a tertiary referral situation and probably don't represent the general population. However, others have found that chronic pain symptoms were relatively stable and their severity and disability was explained largely by pain, psychological status and functional disability. Return to work rates for various programs are reviewed by King and Kelleher (1991).

COMPENSATION / LITIGATION AND CHRONIC PAIN

Disability/Compensation Issues

Chronic pain has become a major issue for compensation, insurance companies and society. In a recent paper by Cameron (1994), representing London Life Insurance Company, Fibromyalgia represented 2.8% of all long term disability claims, and monthly payments totalling over $182,000 to that company. Repetitive strain injury was projected to represent 1.9% of all long term disability, with monthly payments totalling over $109,000. On the basis of their relative share, they calculate that fibromyalgia, chronic fatigue syndrome and repetitive strain injury cost Canadian insurance companies $100,000,000 annually. Cameron felt this was a significant problem and of such a magnitude that insurance companies should participate in research into these conditions.

Many reports in the literature suggest that compensation benefits increase the risk for prolonged recovery time from back injury (Shealy, 1976; Hammonds, Brena, and Unikel, 1978; Craig, 1982). Also, it has been suggested that how employees like their job, or their supervisor (Florence, 1991; Nachemson, 1994) is correlated significantly with the length of recovery time. Others disagree, and the multidisciplinary BEEP program in British Columbia could not confirm these observations. Other prominent workers (Melzak, 1985; Dworken, 1985) have shown that the common stereotype of the compensation/litigation pain patient as neurotic or a malingerer is erroneous (Marchioli, 1987). Mendelson (1994) has noted that patients on compensation are not more neurotic than those not on compensation; they do not describe their pain as being more severe; and they actually appear to be less psychologically disturbed. However, compensation can prolong recovery and adversely affect the response to treatment. Such adverse responses can be modified and minimized by good multi-disciplinary approaches to management. Compensation patients are virtually indistinguishable from noncompensation patients on the McGill pain questionnaire and the Minnesota Multiphasic Personality Inventory. In contrast to other suggestions, the study by Dworken suggested that the common predictable factor in both groups was the availablility of employment following treatment.

Advocate vs Evaluator

Sullivan and Loeser (1992) reviewed the rating of disability in a pain clinic, and raised the question about whether it is ethical for one physician to both treat pain and rate disability in patients with chronic pain. They also question whether physician rating of disability due to pain was scientifically valid.Their answer to both questions was "no". They then proposed a system of time-limited compensation for pain as a therapeutically superior alternative to disability ratings.

The issue was precipitated by the attending physician staff of the University of Washington Pain Clinic who felt that such ratings were not part of their job as treating physicians, and that such ratings could interfere with patient care. The reasons were:

1) The roles of treating and rating physician are not compatible in the case of chronic pain.
2) The measurement of disability due to pain through physician ratings is confused and probably invalid.

They raised the interesting issue that patient trust in the physician often caused them to reveal information that might be deleterious to their rating, when the physician is seen by the patient as a trusted caregiver, when in fact the physician is acting as an agent for WCB or for an insurance company. Physicians might be less candid if they sense that their physician were doing some "police work" for an institution. More dangerous, however, is that the patient will not immediately notice that his physician has "switched allegiance", they feel. They also make the interesting observation that rating disability is not a medical act.They state that a physician performing a disability rating is using skills and authority to fulfill a non-medical agenda that is concerned with compensability rather than treatment.The difference between compensability and non-compensability disabilty and is not a medical difference. Disability rating is largely medical in technique, but not in purpose. Thus, diagnosis serves legal rather than medical ends. They conclude that it is potentially injurious to patients when one physician is doing both treating and rating, and they think that the capacity for counter therapeutic conflict is greatest in both treating and rating chronic pain. They conclude, "Disability ratings are pseudomedical and pseudoscientific. They are medical in technique, but not in purpose."

Patients with pending litigation or disability compensation have shown improvements in activities of daily living and pain scores equal to those without compensation. However, those who have permanent compensation have much lower return-to-work rates compared to those with pending litigation or time limited compensation. Treatment drop-out rates are nearly twice as high for patients receiving compensation. Detecting conflicting goals is important in therapeutic programs and it would be helpful, although not very practical, to be able to put the financial issues aside.

Adversarial vs Support Systems

Workers seeking compensation are often viewed with suspicion and scepticism. The adversarial nature of the compensation system fosters an atmosphere of mistrust and prolonged proceedings often engendering fear, anxiety and depression in the patient.The views of some have been less than receptive toward the notion of workers compensation and the system that provides it (Collie, 1932, in Mendelson, 1992).

The position of the worker has had little sympathy as shown by the strong views of Kennedy and Miller. The frequently quoted Kennedy illustrates this well in his definition of "compensation neurosis" as "a state of mind, born out of fear, kept alive by avarice, stimulated by lawyers, and cured by a verdict" (Kennedy, 1946, in Mendelson, 1992). Miller (1961, in Mendelson, 1992) conducted a study of 50 litigating patients that largely supports the view of Kennedy, but has since been severely criticized for its highly selected patients and other methodological shortcomings. Most recent findings tend to negate these early studies and make the concepts of 'accident neurosis' or 'compensation neurosis' obsolete. Kelly (1981) showed that Miller's 5 propositions for "accident" neurosis were myths.

There is still too much misunderstanding on both sides to easily move from an adversarial system but we need to more away from attitudes that are harmful to both sides.

Workers and Compensation and Litigation

It is generally believed that once a patient assumes a sick role or establishes pain behaviour with disability the probability of this becoming chronic is greatly increased and conversely, the probability of returning to work greatly diminished. Solomon and Tunks (1991) reported on 80 litigating and 47 non-litigating patients who suffered chronic pain. The found that contrary to common belief, litigating patients did not differ from non-litigating with respect to being off work. Nor was litigation predictive of down time or medication use. Litigating patients were significantly more depressed than non-litigating with respect to Zung depression scores. Solomon and Tunks (1991) concluded that "the suspicion and mistrust with which litigants are treated appears to be unfounded." Furthermore, the practice of seeing litigation as the primary cause of disability (instead of a possible contributor), and of delaying treatment until litigation is complete, ought to be discontinued. Litigation, according to Solomon and Tunks (1991) should not prevent a patient from receiving treatment as this delay may only worsen the prognosis.

Tait et al (1990) classified 201 chronic pain patients according litigation and working status. These patients were then compared on several variables: pain, disability, psychological stress and selected demographics. They found that working patients, when compared to those receiving workers compensation, reported less disability and pain of longer duration. With respect to litigants, non-litigants reported less pain and less disability. With respect to psychological distress, as measured by depression and anxiety, interactions were found. Patients who were on workers compensation and litigating reported less distress than non-litigants. Whereas, patients who were working and litigating reported more distress than non-litigants. Tait et al. (1991) suggest that for the workers compensation patients, retaining a lawyer, may have been an effective coping mechanism for dealing with the stress of an adversarial medico-legal system.They postulate that stressors are different for compensated patients than for those still working. The compensation patients are stressed by the proceedings, whereas the working patients are stressed by the demands of working while in pain.Thus litigating relieves the stress of the compensation patient but not the stress of the patient still working.

Dworkin (1990) in a letter to the editor of the journal Pain, points out that the common association of compensation with degree of pain, disability, unemployment, and psychological distress is not necessarily causative, despite the fact that is it often perceived this way. These associations could be covariates or more importantly, compensation may be a consequence of pain and disability, not a cause.

Guest and Drummond (1992) compared 19 patients receiving compensation with 18 patients who had settled their claim. They found that compensation recipients showed more emotional distress, greater inability to cope with pain and more disruption of daily living than those who had resolved their claims.

However they also found considerable evidence of emotional distress even after settlement. Thus suggesting that patients are not necessarily cured by a verdict. Guest and Drummond (1992) acknowledge the potentially harmful long term effects of pending settlement with possible financial reward, as this promotes the chronicity of the condition and thus possible unemployment. This can lead to financial hardship and an overall worse situation for the patient. They advocate encouraging the worker to seek gainful employment elsewhere as soon as possible following injury and to incorporate this paradigm into the compensation system.

Dworkin highlights the fact that although it is sometimes "shown" that patients who are receiving benefits or who have litigation pending do not benefit as much from treatment or have poorer outcomes, the results are inconsistent. Dworkin theorized that the variability of the results may be accounted for by the employment status of the patients, as some continue to work while receiving benefits or pending litigation. Dworkin (1985) undertook a study of a series of 454 chronic pain patients in which the relationship of compensation, litigation, and employment to chronic pain was examined. He found that although compensation benefits and employment status both predicted poorer short-term outcomes, only employment status predicted long-term outcomes. Neither the receiving of benefits nor pending litigation predicted long-term outcome. He suggests that efforts ought to be directed toward the role of activity and re-employment in the treatment of chronic pain patients and that less attention be paid to negative effects of 'compensation neurosis.'

Tait et al (1988) studied 122 chronic pain patients and the relationship of compensation status to symptoms. Among this pool of patients 70 were involved in some aspect of the compensation system (workers compensation, litigation or social security), and 52 were not. Tait found that compensation patients could be distinguished from non-compensation patients on symptom self-report. Compensation patients were younger, more likely male, reported, pain of shorter duration, fewer surgeries, and more vocational and sexual disability. Compensation patients did not differ in their pain reports (frequency, severity, disruption) nor in psychological distress from non-compensation patients. Compensation patients did tend to report more dysfunction than non-compensation patients and tended to perceive their condition as more severe than physicians did. Tait et al (1988) speculated that the sick role may be operating in both areas, i.e. dysfunction and physician relationship. Tait et al (1988) suggest that the differing patient-physician perception my be due to, "disease conviction" among compensation patients, or erosion of confidence in the medical community on the part of the patient, or lack of attention to the compensation patients on the part of the medical community due to the common belief of "compensation neurosis." Tait et al (1988) infer that compensation patients are not symptom magnifiers, but rather report "greater life disruption related to their pain" than non compensation patients. As well patients and physicians seem to develop mutually nonbeneficial attitudes toward each other that serve only to hinder the patients rehabilitation.

Tollison et al (1990) compared a group of 15 compensated versus 15 non-compensated patients admitted to a pain center for treatment and rehabilitation. At the time of discharge the compensated group differed significantly from the non-compensated group and were worse off on 3 of 5 measures: increased physical activity, reduced pain intensity, and return to productivity. The non-compensated group showed a better therapeutic response. However, the differences disappeared at 3 month follow-up.

Fishbain et al (1988) investigated 283 chronic pain patients and the occurrence of DSM-III-R diagnosis in compensated versus non-compensated patients. Male compensated and non-compensated patients were compared, and similar comparisons were done for females. Fishbain et al (1988) found that compensated males were significantly overrepresented in 3 diagnostic groups: conversion disorder (somatosensory), combined personality disorders, and passive-aggressive disorder. Male non-compensated patients were significantly overrepresented in 3 categories: no diagnosis in Axis I, combined personality type, and compulsive personality type. Compensated females were significantly overrepresented for conversion disorder only, non-compensated females were overrepresented in generalized anxiety disorder, and combined anxiety syndromes. Fishbain et al (1988) concluded that both compensated males and compensated females are at greater risk for somatosensory conversion disorder, and that compensated males are at greater risk for personality disorders in general and passive-aggressive personality in particular. Non-compensated females are at greater risk for anxiety disorders.

Melzack et al (1985) reports on 145 chronic pain patients attending the pain clinic at the Montreal General Hospital. Of these patients, 42 patients were receiving compensation and 103 were not. Melzack et al (1985) scored the patient responses to McGill Pain Questionnaire using weighted rank scores to deal with the criticism of the loss of information due to rank scoring alone. The comparison of compensation versus non-compensation patients revealed virtually no difference in pain scores and pain descriptor patterns. Compensation and non-compensation patients were also similar the MMPI categories of depression, hysteria, hypochondriasis and other personality variables. Significantly lower affective or evaluative MPQ scores, and fewer visits to health professionals for compensation versus non-compensation patients were the only significant differences found. Melzack et al (1985) concluded that compensation patients are not different than non-compensation patients with respect to degree of pain experienced, or psychological distress exhibited, and that "Patients on compensation or awaiting litigation deserve the same concern and compassion as all other patients who suffer chronic pain."

Jamison et al (1988) compared 3 groups of chronic pain patients, 44 were receiving no compensation, 27 were receiving time-limited workers' compensation, and 39 were receiving unlimited social security disability benefits. The subject pool was derived from 110 patients referred to the Vanderbilt Pain Control Center and all participated in a multimodal treatment program.These 3 groups were compared for the effects of their benefit duration on pain intensity, medication use, activity levels and return-to-work status. Results showed the disability patients, relative to the no-compensation and time-limited compensation patients, to have a higher percentage of symptom dramatization and pain behaviour as rated by physician, and higher medication use. However, at 12 month follow-up no differences between the groups were found on pain intensity, medication use, or activity level. However, with respect to return-to-work, more non-compensation, and time-limited compensation groups patients had returned to work at 12 month follow-up than disability patients. The Jamison et al (1988) results suggest that time-limited compensation does not adversely effect either chronic pain patient treatment outcome or likelihood of returning to work. Unlimited or disability benefits do appear to have these negative effects. Further, these results also suggest that time-limited compensation patients "do not necessarily represent a 'problem' subgroup of chronic pain patients."

Greenfield et al (1992) in a review of 127 patients with fibromyalgia related to an injury or event fared worse with 70% of the "reactives" losing employment, 34% receiving disability compensation, and 45% showing reduced physical activity. He concluded that the development of fibromyalgia following a triggering event may represent the beginning of a chronic pain condition with serious social and economic consequences.

> "Our society has evolved an intricate feedback process that lives in our background culture, where suffering and pain behavior can result in both tangible and intangible rewards. On the one hand we expect people to return to work; on the other hand, we pay them to be sick. In some settings, we are like the animal trainer who "tells" the sealion to stop a certain behavior and rewards the animal with a fish for the same behavior."

Employment Status, Disability Compensation, and Physical Activity Among 127 Patients with Fibromyalgia

	Primary Fibromyalgia (n = 98)*	Reactive Fibromyalgia (n = 29)*	P
Employed prior to fibromyalgia	41 (42)	20 (69)	0.01
Employed at diagnosis of fibromyalgia	36 (37)	7 (24)	0.21
Lost employment due to fibromyalgia	5 (12)	14 (70)	<0.001
Received disability compensation due to fibromyalgia	1 (1)	10 (34)	<0.001
Reduced physical activity prior to fibromyalgia	15 (15)	13 (45)	<0.001
Involved in leisure activity after fibromyalgia	12 (12)	3 (10)	1.0

* Values are the number (%of total group) except in the case of lost employment due to fibromyalgia, where values are the number (% of those employed prior to fibromyalgia).

Greenfield S, Fitzcharles M, Esdaile JM (1992). Reactive Fibromyalgia Syndrome. Arth Rheum; 35(6):678-681.

Tollison studied 61 nonsurgical treated low back injury patients, 32 of which were receiving compensation and 29 were not. Patients were compared at the time of discharge and at 6 month follow-up. The results indicate treatment outcome differences on 2 measures, subjective pain intensity and return-to-work, at the time of discharge. However, at 6 month follow-up, difference in only one outcome measure - subjective pain intensity - was seen. Unlike at the time of discharge, no significant differences were found in return-to-work rates between compensated and non-compensated patients at 6 month follow-up.

Talo et al (1989) examined the effect of litigation and compensation on patient outcome, in patients with chronic pain. Talo et al (1989) pointed out that other investigators often examine the effects of workers' compensation on treatment without accounting for the effects of completed or ongoing litigation. Similarly, some investigators studied the effects of litigation only without accounting for workers compensation status. Talo et al (1989) classified 60 patients from multidisciplinary pain centers according to their litigation status (completed versus ongoing) and workers' compensation status (receiving versus not receiving). Thus there were 4 groups created for comparisons: workers' compensation patients with active or completed litigation and other accident patients with active or completed litigation. Talo et al (1989) found no significant differences between the groups in organic or psychological pathology after discharge (mean follow-up time = 2 yrs, 1 month). Although, overall improvements were seen for the entire group as a result of the treatment program, workers' compensation patients with completed litigation improved the least. Despite this failure to show significant improvement among this group, they do show better return-to-work rates than workers' compensation patients with pending litigation. Talo et al (1989) offer the following explanation.This lower return-to-work rate for pending litigants who are on workers' compensation may be inherent in the compensation / legal system, as the worker may feel compelled to maintain their sick role lest they not be taken seriously. Thus the compensation system itself may be hindering rehabilitation. Talo et al (1989) advocate early intervention as a means of promoting good prognosis and better treatment outcomes.

Mendelson (1982) in a review article critically examines the Miller (1961) position that patients are "cured by a verdict." He reviewed several papers related to chronic pain and compensable injuries of various kinds including, low back injuries, head injuries, and neck injuries. Mendelson (1982) concluded that "To the best of my knowledge, all studies published in the last 20 years have shown Miller's conclusions to be incorrect ..."

Moldofsky et al (1993) investigated the relationship of litigation, and other factors to chronic postaccident pain. Eight patients with resolved litigation were compared with 16 whose litigation was unresolved. Patients from the resolved group were distinguished from the unresolved group in that they were older, had longer duration of symptoms, and showed more occupational disability. There were no significant differences in sleep disturbance, pain symptomology, nature of accident, other demographic measures, or disability, except occupational handicap, between the resolved group and those with ongoing litigation. Thus in general unresolved litigants, tended to be older with poorer occupational adjustment, despite their showing no difference in their symptoms.

Moldofsky et al (1993) speculated that this may be due to natural deterioration in occupational adjustment as patients age (the mean postaccident pain duration was 13 years for the resolved group versus 2 years for the unresolved group). They also speculate that after compensation is settled, patients may quit trying to work at a lower level of productivity that accompanies their chronic pain.This may account for the difference in occupational adjustment. In addition, Moldofsky et al (1993) states the furnishing of financial benefits may encourage a situation of illness behaviour that sustains work disability and compensation. Since the only difference in disability measures was found in occupational handicap yet, "There were no difference between the resolved and unresolved groups in severity of disability, future outlook, ratings of handicap related to physical independence, mobility, or social and economic status." Other authors, (Binder, 1991, and Trief and Stein, 1985; in Moldofsky et al, 1993), suggest that the litigation process may have a negative impact on patient outcome and that the delay in compensation or treatment is not justified.

Bruusgaard et al (1993) compared the incidence of fibromyalgia in 2 neighbouring counties in Norway. They found a 4 fold greater incidence of fibromyalgia as the reason for disability pension between Aust-Agder county versus Telemark county. In fact fibromyalgia was the single most frequent diagnosis as a reason for disability pension in Aust-Agder county. They explored 3 possible explanations for this difference: patient factors, physician factors, or system factors. Their investigation found no differences in morbidity pattern between counties, and thus ruled out patient factors as an explanation. The reason for such a large difference in fibromyalgia being accepted as a cause for disability appears to be the difference in the use of diagnostic labels by physicians and the different evaluation by the insurance system. In Aust-Agder county the primary consultant for the insurance offices was a specialist in physical medicine whereas in Telemark it was a psychiatrist with a keen interest in somatoform disorders. Consequently the difference in the prevelance of fibromyalgia may be explained by different physicians favoring one diagnosic label over another. Thus a diagnosis of fibromyalgia and subsequent compensation, depends more upon the diagnostic setting and assessment by the insurance company than actual morbidity.

Bruusgaard et al (1993) question the long term benefit, with respect to prevention and management, of giving the label "fibromyalgia" to patients with "widespread complaints from the musculoskeletal system." The scepticism seems to arise out the relatively young age (mean = 46.4 yrs.) of patient receiving disability pension as a result of fibromyalgia.

Kapusta (1994) succinctly outlines the dilemma of the parties involved in compensation issues involving chronic musculoskeletal conditions. In the absence of organic findings, physicians are in the predicament of having inadequate diagnostic criteria, modes of treatment, or objective means to assess disability in patients with chronic musculoskeletal complaints. The patient's predicament stems from the confusion of varying (if not contradicting) medical diagnoses, in patients with poor "treatment" outcome, and the fear of having to constantly validate one's "injury" to the compensation system. Kapusta advocates establishing a means of early detection and intervention for such patients, so that they may "be promptly extricated from the compensation process, which for them is likely to be long and damaging."

In a comprehensive review article by Mendelson (1991) the relationship of chronic pain to compensation is explored. Specifically the relationship of compensation/litigation to, the experience of pain, the response to treatment and chronic pain under different compensation schemes are examined. In addition the validity of the notion of compensation neurosis is critically assessed. From this extensive review, several conclusions were drawn.

Mendelson (1991) concurs with Kelly and several others as to the invalidity of 'compensation neurosis' and states that "... compensation claimants cannot be distinguished from non-litigants with similar symptoms, and that the assumed 'predictive value' of the label "compensation neurosis", namely that litigants improve after the case is finalized, is simply not supported." Second, Mendelson considers the influence of litigation/ compensation on the experience of pain. Mendelson reviews several studies that compare litigating and non litigating patients with and without concurrent receipt of compensation. As well studies comparing compensated versus non-compensated patients without any litigation were reviewed. In all cases, and on different measures of pain experience (McGill Pain Questionnaire, IBQ) the outcomes were the same, patients' pain experience was indistinguishable on the basis of litigation, compensation or both. Thus Mendelson, (1991) concluded that litigation/compensation has no effect on the patients experience of pain. Third, Mendleson (1991) explored the role of litigation/ compensation in the response to treatment and patient outcomes. Mendelson draws to our attention that early studies investigating the effect of compensation on recovery largely show a consensus on the negative impact of compensation on response to treatment. However, later studies show that the relationship may not be that simple. Mendelson reports on 4 studies, 2 of which show a negative impact of compensation on recovery and 2 which show no effect of compensation on recovery. Moreover, what emerges from studies on both sides of the argument, is that even where compensation may be shown to hinder recovery, the effect can be modified substantially by a directive approach to treatment that focuses as much on the behaviourial aspects of the illness, as it does on the biomedical aspects. Better long-term outcomes are seen in regiemes that highlight the importance of activity, restoration of function and the return to work as soon as possible. In studies where re-employment, exercise, and early mobilization are emphasized, the prognoses are better than those treatments that do not advocate such regimes. This approach also has the advantage of preventing "learned pain behaviour" that can promote chronicity of the injury or pain and have detrimental long term financial, emotional, and social effects for the patient.

The fourth factor that Mendelson considers is also of considerable interest compares the status of compensation claims for chronic pain across jurisdictions in which the nature, structure, and mechanisms of compensation differ. He compares 2 types of compensation systems, one in New Zealand, the other operative in the United States. The primary difference between these 2 compensation systems is that the type found in the United States is the traditional adversarial system in which the onus is on the claimant to prove the case of disability against a sceptical and mistrusting compensator. This allows for personal injuries claims to be litigated in court, often involving lengthy acrimonious proceedings. New Zealand, however, since 1974, has instituted a universal no-fault system. Under this scheme the traditional workers compensation system, and the right to sue for personal injuries were abolished. The scheme provided benefits to all New Zealanders in the event of injury irrespective of fault or circumstance. Thus this system avoided litigation and the adversarial nature inherent in such a plan.

Carron et al (1985, in Mendelson, 1991) compared pain and disability rating and outcomes in patients referred to pain clinics between New Zealand and the United Sates. They found that 49% of the U.S. sample versus only 17% of the New Zealand sample were receiving pain-related compensation at the time of referral. The U.S. patients fared worse than the New Zealand patients on several measures. Significantly more U.S. patients reported sleep disturbance, reduced social/ recreational activities, and impaired libido at time of referral. Upon follow up a similar picture emerged, with the U.S. patients reporting greater pain intensity and frequency, greater limitation of activity, and lower return to full activity and work.

When New Zealand is compared to neighbouring Australia, with respect compensation payments for rear-end collision whiplash injures some striking differences were noted. In Australia people are also allowed to litigate for personal injury. It was found that in Australia, there were 3 times the number of claims made for whiplash injury, and that the average award was 3 times greater (Mills and Horne, 1986 in Mendelson, 1991). These 2 patient groups were also compared for return to work rates 6 months post injury. Significantly more New Zealand patients than Australian patients (98% versus 72%) had returned to work at 6 month follow-up.

Legislative changes regarding compensable injury can have significant effects on the number of claims, the amount awarded, and the duration of disability. Mendelson (1991) reports on 2 cases where opposite effects are seen as a result changing the circumstance under which claims can be made. The first case relates to whiplash injury and the number of claims following changes in Australian law. The new law made eligibility for benefits contingent upon filing a police report, charged a user fee for medical services, and limited claims to major injury and impairment. Following the introduction of these new regulations there was a 70% decrease in the number of whiplash injury claims compared the period prior to new law.

However with the introduction of a new workers' compensation system in Australia, called WorkCare, the opposite effect occurred. The new system was designed to "speedily and efficiently" adjudicate claims and to provide "suitable and just" compensation to injured workers. The plan provided for benefits of 80-85% of pre-injury income. This benefit level was 20% higher on average than that available under the old scheme. Following the introduction of the WorkCare system, there was a 98.4% acceptance rate of claims versus a 60-80% acceptance rate from the previous system. Furthermore, the percentage of claims lasting more than 12 months went form 2.5% under the previous system to 12-18% under the WorkCare system (Mendelson, 1991).

An interesting phenomenon is that noted by Nachemson (1976; in Mendelson, 1991) of a "threshold of disability claims." It seems that once the amount a wage earner can receive during the illness period exceeds 55% of pre-illness earnings the number of claims escalates dramatically.

As result of these trends the Australian WorkCare system was amended to award only 60% (instead of 80%) of pre-injury wages for those claims lasting more than 12 months with provision for those who are totally incapacitated (Mendelson, 1991).

A recent experience in New Brunswick with a reduction of benefits available to employees who incur work related injuries resulted in a significant drop in the number of incidents, days lost and the cost of claims in the private sector. This was due to a drop in both the incidence and duration of each claim. Although the legislation had not been instituted in the hospital sector due to pre-existing collective agreements, there was still a significant drop in days lost (Allison and Weiss, 1994).

From the review of the litigation/compensation literature some conclusions can be drawn. It is clear that the label "compensation neurosis" or "accident neurosis" is no longer warranted. Such labelling has deleterious effects for all parties concerned, be they physician, patient or compensator. This label serves only to frustrate both patient and physician, deny patients of necessary treatment, and promote less than amicable relations among employers, employees and compensators. Furhthermoe it is clear that patients are not "cured by a verdict."

The second conclusion is that the prospect of compensation has no bearing on patients experience of pain following injury. Thus a patient's pain status can not be determined based on their compensation status.

Third, the presence of litigation or compensation can have negative effects on the rate of recovery of chronic pain patients. However, this is often a short-term effect that usually disappears upon follow-up. Moreover, this can be easily modified with appropriate management and sufficient attention to the behaviourial aspects of the chronic pain. With an eye to the prevention of learned pain behaviour, so as to thwart the patient from engaging in a chronic sick role, a patient can be returned to productive level of activity.

Fourth, the vary nature of the current adversarial compensation system, may be partly responsible for creating chronic pain patients. Thus a review of this system and its effects may be warranted.

Unfortunately, there is not much evidence that the controversies regarding chronic pain and conditions such as fibromyalgia are being settled. Dr. J Verrier-Jones and Dianna Ginn, a rheumatologist and a lawyer from Halifax, have written an article entitled, "Fibromyalgia: The Canadian Courts have Spoken!" and review the nature of the controversies and the court views. They note that Dr. Simon Carette, (1993) a leading Canadian authority, believes "we should also be extremely cautious before declaring a patient with fibromyalgia to be an invalid. In an editorial in the Journal of Rheumatology, he outlined five guidelines for providing evidence of disability in patients with fibromyalgia associated with traumatic event. Verrier Jones and Ginn conclude that despite the varying views of experts, it will often be the courts that make the decision about whether someone is eligible for compensation. They reviewed cases of fibromyalgia that were settled in the court and the decisions related to these.

Verrier-Jones and Ginn outline the court cases on four cases of fibromyalgia and reached a number of conclusions. The first was that the courts are prepared to accept pain as a cause of disability in the absence of any evidence of physical impairment. Next, the courts are inclined to attach greater weight to the family physician than to consultants, based on the principle that the family physician knows the patient over a prolonged period of time and knows them best. Evidence of the expert, and video tapes of patients functioning reasonably normally did not sway the courts from their decision.

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APPENDICES

TERMS OF REFERENCE

APPENDIX A

TERMS OF REFERENCE

A. Background

In May 1994, the Board of Directors of the Workers' Compensation Board ("the Board") identified for consultation the issue of entitlement to compensation for workers with the condition commonly known as "chronic pain syndrome".

The Board is seeking a comprehensive medical study and discussion paper comprising information in respect of the definition and work-relatedness of chronic pain syndrome and any related conditions. This study is being undertaken in a manner to engender consultation, as the Board's ultimate decision may have a significant impact on stakeholders and the system.

For the purposes of this Terms of Reference only the term "chronic pain syndrome" is used to be consistent with definitions used in the policies of the workers' compensation boards of Alberta, Newfoundland and Labrador, and Ontario for chronic pain syndrome or chronic pain disability, and the leading Ontario decision dealing with the issue:

"Chronic pain syndrome" has been described by other workers' compensation boards as pain which persists for six (6) or more months beyond the usual healing time for the injury, and which results in marked life disruption.

"Marked life disruption" indicates the effect of pain experienced by the worker and the effect on the worker's activities of daily living, vocational activity, physical and psychological functioning, as well as family and social relationships.

B. Overall Goal of the Study

The overall goal of the study is to assist the Board to better understand:

a) the nature of chronic pain syndrome and any related conditions;

b) the nature and extend of the connection between the conditions and the workplace; and

c) the basis for the development of policy-related options on chronic pain syndrome and any related conditions, and the Board's ultimate decision on entitlement for these cases.

C. Objectives of the Study

The consultant should address the following major questions:

1. the relationship and categorization of pain to the medical recovery process following an injury;

2. whether there is satisfactory evidence at this time to conclude that chronic pain syndrome may be considered an identifiable entity or entities;

3. if the answer to number (2) is "yes", whether there is a probable connection that may exist between the condition and a workplace exposure, process, trade or occupation;

4. whether there are any other conditions, such as fibromyalgia, that are related to chronic pain syndrome and if so, whether there is a probable connection that may exist between the condition and a workplace exposure, process, trade or occupation.

D. Specific Issues to be Examined by the Consultant:

Without restricting the generality of the assignment as outlined in the "Objectives" section above, the consultant should give attention to the following issues:

a) the effect of the existence of pre-disposing medical conditions on the existence, duration, and/or severity of chronic pain syndrome;

b) the effect of secondary gain, if any, on the duration and/or severity of the pain;

c) whether it is appropriate and possible to determine a "usual" sensitivity to pain, an innate ability to tolerate pain, or motivation;

d) whether "usual recovery times" are valuable in the identification of a chronic pain syndrome case;

e) the quantity and quality of medical evidence necessary to make a determination on a chronic pain syndrome case;

f) the necessity and ability to seek "objective medical findings" when making a determination on pain cases;

g) the viability of apportioning causation between the workplace incident and other causes of the chronic pain syndrome;

h) whether cases can be divided into categories - "attributable predominantly to an organic cause" and "arising predominantly from psychological sources";

i) a standard glossary of terms related to the issues;

j) the relationship and categorization of pain to the medical recovery process following injury;

k) whether there is satisfactory evidence at this time to conclude that chronic pain syndrome may be considered an identifiable entity or entities;

l) if the answer to k) is "yes", whether there is a probable connection that may exist between the condition and a workplace exposure, process, trade or occupation;

m) whether there are any other conditions, such as fibromyalgia, that are related to chronic pain syndrome and if so, whether there is a probable connection that may exist between the condition and a workplace exposure, process, trade or occupation.

E. Approach to be Used by the Consultant in Carrying Out the Study

In considering the issues listed under the heading of "Objectives of the Study", the consultant will undertake and complete the following research:

a) a medical literature search, encompassing global medical literature;

b) a review and summary of the medico-legal research.

In conclusion of the study, the consultant will prepare a draft report for the Board's Review Committee on Chronic Pain. Following review and acceptance by the Committee, the Chief Executive Officer, and the Board of Directors, the report will be circulated for discussion and comment to persons and organizations relevant to the issue (physician associations, health care providers, hospitals/clinics, business organizations, injured workers' representatives/groups, unions, WCB employees).

The consultant will summarize the results of the discussion, and amend the report if appropriate. The consultant's final report, accompanied by a policy recommendation from WCB staff, will be presented to the Board of Directors for their decision.

F. Timing of the Study

This study is to be completed no later than October, 1994. A draft of the final report is to be made available to the Chief Executive Officer of the Board no later than December 20, 1994. Progress reports are to be made monthly to the Review Committee on Chronic Pain.

The members of the Review Committee are:

Project Manager: Jim Houston, Director, Policy Department

Members: David Stuewe, Chief Executive Officer
Joe Pinto, Executive Director, Client Services
Dr. Tom Dobson, Administrator, Medical Services
Suellen Murray, Policy Analyst

APPENDIX B

REVIEW OF THE MEDICO-LEGAL RESEARCH

APPENDIX C

GLOSSARY OF TERMS

Glossary of Terms

Abnormal Illness Behaviour: The primary indication of abnormal illness behaviour is that an ardent conflict exists between the physician and the patient as to the degree of the sick role to which the patient is entitled. Patients with bonafide abnormal illness behaviour have excessive difficulty in accepting the advice of any physician if it does not coincide with their own assessment of their health status (Bonica, 1990).

Acute Pain: Acute pain is a collection of unpleasant sensory and emotional experiences and associated physiologic, emotional and behavioral responses, provoked by noxious stimuli, produced by injury, disease, malfunctioning of muscle or viscera that may or may not cause tissue damage. (Bonica, 1990)

Alpha Non-Rapid Eye Movement-Electroencephalogram Sleep Anomaly (or Alpha-NREM-EEG Sleep Anomaly): To understand what this anomaly is one must first know something about the normal pattern of brain activity during sleep as recorded by an electroencephalogram (EEG). There are 4 stages of sleep in a normal sleep pattern, each with its own distinct wave pattern on EEG. As one begins to fall asleep alpha waves (8 to 12Hz) begin to intrude on the low amplitude, high frequency waves of wakefulness. As one enters sleep, stage 1 sleep begins, and is marked by low amplitude, high frequency wave, resembling wakefulness but slower. As one continues to sleep the EEG wave pattern shows a gradual increase in amplitude and decrease in frequency through stages 2, 3, and 4. Stage 2 sleep is recognized by sudden up-down deflections in the EEG recording (K-complexes), and bursts of 12 Hz to 14 Hz wave patterns (sleep spindles). Stage 3 is marked by periodic Delta waves, the highest amplitude and slowest frequency (1 -2 Hz) EEG waves. Stage 4 sleep is essentially all Delta EEG waves. REM sleep, or Rapid Eye Movement sleep occurs in stage 1 (Pinel, 1993).

The alpha NREM-EEG sleep anomaly is primarily the intrusion of the rapid alpha EEG wave pattern of wakefulness into the slower Delta EEG wave pattern of the deep, restorative, stages 3 and 4 sleep. The alpha frequency, however is not restricted to delta intrusion, and may show up in stages 1 and 2, but only during non-REM sleep, hence the further qualification of NREM in the name of this sleep anomaly (Moldofsky, 1989).

Alprazolam: Is an anxiolytic/sedative drug used to treat the symptoms of anxiety. See Anxiolytic and benzodiazpines (Canadian Pharmaceutical Association, 1993)

Amitriptyline: Is a an antidepressant drug belonging to the tricyclic class of antidepressants. Tricyclics are so called because they have a 3-ring molecular core in their chemical structure. Each ring is comprised of 6 carbons atoms (Julien, 1992). Tricyclics act by blocking the activity of the enzyme monamine oxidase that actively destroys neurotransmitters such as serotonin or norepinephrine, thus increasing the levels of these neurotransmitters in the brain. (McKim, 1991).

Analgesia: Analgesia is the lack of or decrease of pain without the loss of consciousness. An analgesic is a drug or agent that relieves pain (Mosby, 1986).

Antidepressants: Are a class of drugs used to counteract the effects of depression, and improve mood. There are 3 types of antidepressants, the MAO inhibitors, Tricyclics, and the so called "second generation" of antidepressants. Most antidepressants increase the levels of monoamines in the brain (McKim, 1991). Some common brand names (with generic names) are Tofranil (imipramine), Elavil (amitriptyline), Asendin (amoxapine) and Aventyl (nortriptyline). (Canadian Pharmaceutical Association, 1993)

Anxiolytic: An anxiolytic is a drug used to provide relief from the symptoms of anxiety or anxiety disorders.(Julien, 1992). Some popular brand names (with generic names) are, Valium (diazepam), Librium (chlordiazepoxide), Mogadon (nitrazepam), Dalmane (flurazepam), Ativan (lorazepam), Halcion (triazolam), and Serax (Oxazepam). (Canadian Pharmaceutical Association, 1993, and Julien, 1992). See also benzodiazepines.

Arthralgia: Arthralgia is any pain that effects a joint (Mosby, 1986).

Beck Diagnostic Inventory: The Beck Diagnostic Inventory is a psychological instrument developed by A.T. Beck in the 1970, as a diagnostic and therapeutic tool for the assessment of depressive illness. It is also known as the Beck Depression Inventory (Mosby, 1986).

Benzodiazepines: Benzodiaepines are group of drugs known as anxiolytics. Anxiolytic drugs are designed to relieve the symptoms associated with anxiety and related disorders (Julien, 1992). Some popular brand names (with generic names) are, Valium (diazepam), Librium (chlordiazepoxide), Mogadon (nitrazepam), Dalmane (flurazepam), Ativan (lorazepam), Halcion (triazolam), and Serax (Oxazepam). (Canadian Pharmaceutical Association, 1993, and Julien, 1992)

Biofeedback: Biofeedback is the process of giving information to a patients, via visual, aural, tactile or other immediate sensory stimuli, about the autonomic physiology of their body, e.g. blood pressure, or muscle tension. Through trial and error the patient learns to control physiological processes previously not thought to be under voluntary control. Biofeedback has been used to treat hypertension, insomnia and migraine headache (Mosby, 1986).

Briquet's Syndrome: See Somatization Disorder

Bursitis: Bursitis is the inflammation of the bursa, the connective tissue structure surrounding a joint (Mosby, 1986).

CAT: See computerized axial tomography.

Chronic Fatigue Syndrome: Chronic fatigue syndrome is a collection of symptoms, consisting mostly of fatigue, myalgias, arthralgias, recurrent headache and sleep disturbances. The syndrome primarily effects women and has no known definitive cause (Moldofsky, 1993).

Chronic Pain: Chronic pain is pain that continues a month beyond the usual course of acute disease or the normal healing time for an injury or is associated with a chronic pathological process. (Bonica, 1990).

Chronic Pain Syndrome: Chronic pain syndrome is a collection of symptoms, including chronic pain, tender points, reduced function, and reactive depression (Clifford, 1993). It may also include sleep disturbance, irritable bowel syndrome, chronic fatigue, memory and concentration disturbance (Waylonis & Heck, 1992). Although many define it as the persistence of chronic pain lasting more than 6 months after the trauma or event, some of the features may be present as early as 2 - 4 weeks after the event.

Classical Conditioning: Classical conditioning is a form of learning in which a previously neutral stimulus (Conditioned Stimulus - CS), through repeated pairing with a natural stimulus (Unconditioned Stimulus - US) comes to elicit the same response as the natural stimulus in the absence of the natural stimulus. For example repeated presentation of a bell (CS) with food (US) to a dog will eventually cause the dog to salivate upon presenting the bell (CS) only, with no food (US) (Domjan, 1993).

Computerized Axial Tomography (CAT): Computerized axial tomography is a computer-aided X-ray procedure for viewing the brain in 3 dimensions. Through a series of X-ray photographs, obtained by rotating an X-ray source around the head, a 3 dimensional image of a section of the brain is assembled by the computer. Several "sections" may be taken (Pinel, 1993). Cyclobenzaprine: Is a muscle relaxant. It relieves skeletal muscle spasm of local origin without interfering with muscle function. It is ineffective in muscle spasm due to CNS disease. (Canadian Pharmaceutical Association, 1993).

Diagnostic and Statistical Manual III - Revised (DSM-III-R): The DSM-III-R is a classification manual that defines mental disorders and strives to furnish specific and operational diagnostic criteria for each mental disorder (Rosenhan & Seligman, 1989).

Dolorimeter: A device used to "quantify" pain by measuring the amount of pressure required to produce pain in a patient.

EEG: See electroencephalogram.

Electroencephalogram (EEG): The electroencephalogram (or -graph) is a course measure of the electrical activity of the brain. The EEG is obtained by placing electrodes on the scalp recording the electrical events of the brain. The EEG represents the sum total of all electrical activity in the brain (Pinel, 1993).

EMG: See electromyogram.

Electromyogram (EMG): The electromyogram (or -graph) is a measure of the electrical discharge of muscles. The EMG is usually taken by recording between 2 electrodes taped to the skin surface above the muscle of interest (Pinel, 1993).

Endogenous Depression: Endogenous means "coming from within the body." Thus endogenous depression is depression due to biological causes as opposed to psychological causes, or events outside the body. This is contrasted with exogenous depression which is believed to be caused by life stressors as apposed to disordered biology (Rosenhan & Seligman, 1989). See exogenous depression.

Endogenous Opioids: The term endogenous refers to that which pertains to, or is from within the body (Mosby,1986). The term opioid, also know as opiate, refers to any natural or synthetic substance that has effects on the body that are similar to that of morphine (Julien, 1992). Thus endogenous opioids are naturally occurring morphine-like substances within the body.

Endorphin: Is a general term referring to any morphine-like chemical that occurs naturally in the brain. It is a contraction of "endogenous morphine-like substance." (Pinel, 1993).

Exogenous Depression: Exogenous depression is depression due to psychological causes or events outside the body, as apposed to disordered biology. This is contrasted with endogenous depression which is believed to have a purely biological basis, and is not due to life stressors. (Rosenhan & Seligman, 1989). See endogenous depression.

Fibromyalgia Syndrome: According to the American College of Rheumatologist (ACR) 1990 criteria, Fibromyalgia Syndrome (FS) has 2 principle features. First a patient must have widespread pain of at least 3 months duration. Second, a patients must show tender points at 11 of 18 anatomical sites. These criteria distinguish FS from myosfascial pain syndrome which is characterized by localized pain, and tenderpoints (Wolfe, et al. 1990)

Hypersensitivity: An abnormal condition marked by unusually heightened sensitivity to stimuli (Mosby, 1986)

Hyposensitivity: An abnormal condition marked by an unusually low sensitivity to stimuli (Mosby, 1986)

Hysteria: A general state of tension of excitement in a person or group characterized by unbridled fear and temporary loss of control of the emotions (Mosby, 1986). Hysterical Conversion Reaction: Is a disorder typified by the loss of physical function not due to any physical disorder, but apparently resulting from psychological conflict. For example a person for no apparent organic reason may suddenly become blind, deaf, partially paralysed or suffer extreme pain precipitated by psychological stress. Hysterical Conversion Reaction is one of the somatoform disorders (Rosenhan & Seligman, 1989).

Ibuprofen: Is an anti-inflammatory analgesic drug used to treat minor pain and inflammation associated with arthritis, headaches or sore muscles or joints. (Canadian Pharmaceutical Association, 1993 and Mosby, 1986)

Incidence: Incidence is the number of new cases of a disease, disorder, condition, over a specified period of time divided by the population at risk. I = Number of new cases / Population at risk, over a period of time (Mausner & Kramer, 1985). For example, 12 cases per 100,000 population per year.

"La Belle Indifference" : La belle indifference is one of the symptoms of hysterical conversion reaction or somatoform disorder, in which the patient is strangely indifferent to their sudden loss of bodily function (Rosenhal & Seligman, 1989).

Magnetic Resonance Imaging (MRI): Magnetic resonance imaging is a sophisticated method for obtaining 3 dimensional images of the brain, using computers and a strong magnetic field.The images are produced form the measurement of waves that hydrogen atoms give off when they are energized by radio-frequency waves in a magnetic field. The advantage of MRI is that is provides a clear image with good resolution even when examining soft tissue such as the brain (Pinel, 1993).

Malingering: Malingering is the willful or deliberate faking of an illness or injury (Mosby, 1986). Malingering is distinguished from somatoform disorder by 2 important features. First, the symptoms of a malingerer are under voluntary control whereas in somatoform disorder they are not. Second, the malingerer has a clear end or goal in mind as a result of the symptoms (e.g. getting out of military service), whereas the person with conversion disorder may not have anything directly to gain from his/her symptom.(Rosenhan & Seligman, 1989) Altough there may be indirect or unconscious benefits such as attention, release from responsibilities, and socially acceptable excuses for limitations and failures.

McGill Pain Questionnaire (MPQ): The MPQ is a widely used questionnaire to assess a patients pain. It scales pain in 3 dimensions, sensory, affective, and evaluative. As a clinical instrument the MPQ helps define the quality of a patients pain with respect to both its sensory component and affective impact (Bonica, 1990).

Minnesota Multiphasic Personality Inventory (MMPI): The MMPI is a widely used personality inventory that contains 550 items that looks into a wide assortment of behaviours, thoughts and feelings (Rosenhan & Seligman, 1989).

MMPI: See Minnesota Multiphasic Personality Inventory.

MPQ: See McGill Pain Questionnaire.

MPS: See myofascial pain syndrome.

MRI: See Magnetic Resonance Imaging.

Myalgia: Diffuse muscle pain, usually accompanied by malaise occurring in many infectious disease such as brucellosis, influenza, and measles, and rheumatic diseases such as fibromyalgia syndrome and myofascial pain syndrome (Mosby, 1986)

Myofascial Pain Syndrome (MPS): Myofascial pain syndrome encompasses a wide array of muscle disorders indicated by the occurrence of hypersensitive points, called trigger points (TP's), within "one or more muscle and/or investing connective tissue" with an accompanying syndrome of "pain, muscle spasm, tenderness, stiffness, limitation of motion, weakness, and occasionally autonomic dysfunction." The symptoms are commonly referred to a an area distant to the trigger point (Bonica, 1990).

Nociceptor: A neural receptor adept at sensing noxious stimuli or stimuli that would become noxious if they persist (Bonica, 1990).

Nociception: The process of sensing noxious stimuli, by the neural system (Bonica, 1990).

Noxious Stimulus: A noxious stimulus is a stimulus that damages or has the potential to damage tissue. Alternatively, a stimulus is noxious if it is sufficient to produce nociception, in the absence of tissue damage (Bonica, 1990).

Operant Conditioning: Operant conditioning is a form of learning that involves contingent reinforcement (i.e. punishment or reward immediately following the behaviour) that either increase or decreases the likelihood that a particular behaviour will occur (Domjan, 1993).

Pain Threshold: The minimum amount of pain that is just detectable by a subject (Bonica, 1990).

Pain Tolerance Level: The maximum level of pain that a subject is able to bear or tolerate (Bonica, 1990).

PET: See positron emission tomography

Positron Emission Tomography (PET): Pet scans provide information about the physiology of the living brain. In a common version of the PET scan a patient is injected with radioactive glucose, 2-

deoxyglucose (or 2-DG) and is then monitored for the metabolic activity in the brain. This is possible because 2-DG is readily taken up by the brain as it is very similar to glucose, but is not metabolized by it (Pinel, 1993).

Post-Traumatic Stress Disorder: In Post-traumatic stress disorder an individual experiences anxiety, depression, hyper-alertness, numbing of affect, and the constant reliving of the trauma after an event that is beyond the range of normal human suffering. Such events would include natural or man-made disasters (hurricanes, floods, earthquakes), combat, rape, torture, imprisonment in a concentration camp (Rosenhan & Seligman, 1989).

Prevalence: Prevalence is the number of existing cases of a disease, disorder, or condition at a point in time divided by the mid-year average population. P = Number of existing cases / total population, at a point in time (Mausener & Kramer, 1985).

Psychodynamic Approach: The psychodynamic approach is concerned with the various psyhcological forces that interact to determine behaviour. The psychodynamic approach is interested in the various drives, motivations, thoughts, and feelings - conscious or unconscious - that influence the mind. According to this paradigm these inner force are often in conflict. Healthy resolution of these conflicts leads to growth, whereas, unhealthy resolution or no resolution leads to anxiety, unhappiness and people who try to defend themselves (Rosenhan & Seligman, 1989).

Psychogenic Regional Pain: Dr. Allan Walters of Toronto developed the concept of psychogenic regional pain, which describes patients who have chronic pain usually in a major portion of the body, or quadrant, and who have clinical signs of wide spread nondermatomal skin tenderness to skin traction between the thumb and forefinger, with collapsing muscle weakness and non-anatomical sensory loss. Merskey recently suggested that the phenomenon described by Walters has some links with fibromyalgia, which has links with myofascial pain syndrome and trigger points, and which tends to be associated with an increased degree of anxiety and depression, but he believe that these almost always follow OR based on the physical cause. (Merskey, 1994)

Merskey also feels that there is a growing thought that fibromyalgia has to do with a dysfunction of the spinal cord and nociceptive pathways. He goes on to say, "plasticity is perhaps the key word and there are so many good examples of regional involvement related to plasticity that it seems to be most likely that when we find substances which have particular affects upon the mechanisms of plasticity in the spinal cord, we will also begin to see a great reduction in the discomfort from regional pain".

Reactive Depression: Is depression caused by an unrealistic and inappropriate response to some identifiable external circumstance or intrapsychic conflict and is relieved when the situation is changed or the conflict understood and resolved. Also called exogenous depression or situational depression. (Mosby, 1986)

Serotonin: Is a neurotransmitter synthesized from the amino acid tryptophan and belongs to the group of neurotransmitter known as monoamines (Pinel, 1993). It is found in platelets, in cells of the brain and the intestine (Mosby, 1989).

Somatic: Somatic is derived from the Greek word "soma" meaning "body." Somatosensory inputs refers to neural signals from all regions of the body including, skin, viscera, muscle, and joints to the central nervous system (brain and spinal cord) (Bonica, 1990).

Somatoform Disorder: Somatoform disorder is the broad category of psychological disorder containing the disorders of hysterical conversion reaction (or simply conversion disorder), somatization disorder (Briquet's Syndrome), and somatoform pain disorder (psychalgia). There are 5 factors that determine if a patient has a somatoform disorder. First, there is loss or altered physical functioning. 2. The is no physical explanation for the loss, i.e. the loss cannot be attributed to any known organic pathology nor is there any of neurological damage. Third, there is positive evidence for causative psychological factors. Fourth, the patient is often indifferent to the physical loss. Finally, the patient does not have voluntary control over the symptoms (Rosenhal & Seligman, 1989).

Somatization Disorder (Briquet's Syndrome): Somatization disorder is characterized by an individual who has a long, complicated and dramatic medical history. The patient displays excessive seeking out of medical treatment, for recurring bodily complaints, from multiple doctors in the absence of any physical illness. Unwarranted surgery, medication dependence, depression and attempted suicide, are common complications of this syndrome. The distinction between somatization and conversion is that somatization patients have multiple physical ailments whereas the conversion patient usually only has one (Rosenhal & Seligman, 1989).

Substance P: Substance P is a naturally occurring substance in the body, generally found in the gut that acts as a neurotransmitter. It is made from several amino acid building blocks and functions in vasodilation and contraction of the intestine and other smooth muscle (Mosby, 1986).

Suffering: Suffering is the state of extreme emotional distress associated with perceptions or events that threaten the intactness of the person, e.g. a sense of impending doom, destruction, or harm. (Bonica, 1990).

Temporomandibular Joint Pain Syndrome: Also known as tempormandibular joint (TMJ) disorders or temporomandibular joint pain dysfunction syndrome. This disorder is an abnormal condition indicated by facial pain and mandibular dysfunction (Mosby, 1986), and tenderness in the joint and surrounding muscles. It may be due to increased tension in the muscles. It may be due to increased tension in the muscles, as in clenching the teeth, which puts pressure on the joint or dental abnormality.

Tender Point: An area or site in muscle or connective tissue characterized by abnormally heightened sensitivity, usually associated with Fibromyalgia Syndrome (Bonica, 1990).

Trigger Point: An area or site in muscle or connective tissue characterized by abnormally heightened sensitivity, usually associated with myofascial pain syndromes. (Bonica, 1990).

Visual Analog Scale (VAS): The visual analog is a device used to help patients indicate the level of pain they are experiencing. The scale usually consists of a 10 cm line with verbal indicators of 2 extremes of pain on either end. For example on one end of the line may be a descriptor such as "no pain at all," and at the other end a descriptor such as, "the worst pain imaginable," or "pain as bad as could possibly be." The patient is asked to indicate where on the line between these extremes there pain currently falls (Bonica, 1990).

Whiplash Injury: An injury of the cervical vertebrae or their supporting ligaments and muscles characterized by pain and stiffness, usually the consequence of sudden acceleration or deceleration, such as in a car collision, resulting in a sudden backward and forward movement of the head and neck (Mosby, 1986).

Whiplash Syndrome: Is a chronic pain syndrome resulting from whiplash injury (Mosby, 1986), with associated symptoms such as sleep disorder, emotional changes and dizziness. See Whiplash Injury.

Work Hardening: Work Hardening is a highly structured, goal oriented, individualized treatment program designed to maximize the individual's ability to return to work. Work Hardening programs, which are interdisciplinary in nature, use real or simulated work activities in conjunction with conditioning tasks that are graded to progressively improve the biomechanical, neuromuscular, cardiovascular/metabolic and psychosocial functions of the individual. Work Hardening provides a transition between acute care and return to work while addressing the issues of productivity, safety, physical tolerances, and worker behaviours. (Commission on Accreditation of Rehabilitation Facilities, 1988) (Lepping, 1991)

Zung Self-Rating Depression Scale: The Zung self-rating depression scale is a self-report questionnaire used to screen patients for depression (Bonica, 1990).

APPENDIX D

TAXONOMY OF PAIN